# SOVIET SUBMACHINE GUNS OF WORLD WAR II

## PPD-40, PPSh-41 and PPS

CHRIS McNAB

WEAPON

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Series Editor Martin Pegler

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# INTRODUCTION

Soviet soldiers rejoice in their victory over Germany, standing atop the Reichstag in Berlin in May 1945. They display a spectrum of weapons – PPSh-41 and (on the left) a PPS-43 SMG, plus assorted German handguns such as a Walther P 38 (second left) and a Mauser C 96 (third left). (Cody Images)

Contrary to the representations of Hollywood action movies, people rarely drop dead on the spot when hit by a bullet. In fact, people are surprisingly resilient to gunshot wounds; even if they eventually succumb to their injuries, they often stay active for minutes, even hours after the initial impact, during which time they continue to be a threat to their opponents. Scientific studies have shown that even if a person's heart, the core of their being, is destroyed by a firearms round, with a bit of spirited motivation that person can stay functioning and fighting for several seconds before they go down.

We are now in the funereal world of terminal ballistics, the study of the effect of bullets on human or animal bodies. On the subject of human incapacitation, a wealth of data now exists from forensic and military fields. One of the most useful summaries of how tough human beings can be when shot comes from Firearms Tactical, a US-based firearms consultancy:

> Instantaneous incapacitation is not possible with non central nervous system wounds and does not always occur with central nervous system wounds. The intrinsic physiologic compensatory mechanisms of humans makes it difficult to inhibit a determined, aggressive person's activities until he has lost enough blood to cause hemorrhagic shock. The body's compensatory mechanisms designed to save a person's life after sustaining a bleeding wound, allow a person to continue to be a threat after receiving an eventually fatal wound, thus necessitating more rounds being fired in order to incapacitate or stop the assailant. (http://www.firearmstactical.com/wound.htm)

The last sentence of this passage is crucial to this book. One certain way in which people can be downed decisively in short order is to hit them with multiple rounds in quick succession, thus maximizing blood loss and plunging the unfortunate individual into massive volume shock, unconsciousness and ultimately, if not treated, death.

The submachine gun (SMG) is the perfect weapon for this horrible purpose. Although individually each of its pistol-calibre rounds has little to offer in the way of range and penetration (at least compared to a rifle), at short distances the inadequacies are balanced out by a brisk rate of fire, which typically exceeds 500rds/min. Furthermore, the full-auto capability of the SMG brings with it all sorts of tactical and training benefits. In urban combat, or action around trenches or emplacements, combat ranges rarely go beyond 50m; at such distances, firepower trumps accuracy, especially if delivered by a weapon that is compact, easy to wield and delivers controllable full-auto fire. Even if the user cannot take careful aim, a burst of fire can be 'walked' onto the target by adjusting the visual impacts of the bullets. Once on target, the hail of rounds will inflict terrible damage to a person in short order, taking them brutally out of the fight. Furthermore, the SMG's forgiving relationship to accuracy, plus the controllability of its low-recoil rounds, means that as long as the gun is relatively simple to operate, even the most rudimentary of soldiers can be taught to operate one successfully.

The PPSh-41 became an iconic symbol of Soviet resistance. Here we see it slung across the back of a Red Army soldier, and fitted with the 71-round drum magazine. (Cody Images)

These were the lessons that the Soviet armed forces learnt during World War II. As we shall see in this book, the Soviets bought into the submachine-gun concept to a greater extent than any other army during the war. Submachine guns such as the PPSh-41 and PPS-42/43, which form the central focus of our study here, were issued on a scale unparalleled among the Axis or the Allies. Within the Soviet infantry, around one in four men would eventually be equipped with an SMG. The experience for the enemy facing such a distribution of weaponry, particularly in great city battles such as those at Stalingrad or Kharkov, was devastating. When this combined with the Soviet tactics of getting and staying close to the enemy, German infantry were often incapable of matching the levels of small-arms firepower produced by their opponents, and tactical sophistication was often drowned out in a hail of 7.62mm rounds.

Our journey through the history and use of the Soviet SMGs of World War II is in many ways an exploration of a classic Soviet design mentality

Soviet soldier Michail Alexejew on the streets of Berlin, 1945. The slung position of his PPSh-41 allowed the gun to be brought into action very quickly. (© Agentur Voller Ernst/dpa/ Corbis)

– it is better to build something simple and rugged that works, than something sophisticated that fails under battlefield conditions. Although the AK-47 has popularly symbolized such a concept, weapons like the PPSh-41 embodied it years earlier. Such guns were built with durability and practicality in mind, the perfect weapons for a mass, often ill-educated army operating in one of the toughest and most climatically changeable environments in the world. For there was no doubting that at the outbreak of war in 1939, the Soviet Army was a massive but rather blunt instrument. There was plenty of available manpower – the Soviet Army of 1941 totalled nine million men arranged into 303 divisions – but Stalin's purge of the officer class in 1937–38 had left an army with a dearth of good leaders, and a wastefully centralized attitude to tactical training. During the war years, training for a Soviet rifleman might last just a few weeks, with much of that time taken up by political indoctrination and instruction by lecture and manual rather than practical field training. The NCOs providing much of the training were of uncertain quality, either inexperienced youngsters or hard, ageing reservists more familiar with the tactics of the previous world war. Weapons training could be appallingly brief; for some soldiers, familiarization with small arms often came on the battlefield rather than the training ground, and they might be lucky to fire five rounds from a rifle before going into action.

This unforgiving context must be borne in mind during the following history. What we see with weapons such as the PPSh-41 and PPS-43 are guns that displayed a fundamental honesty about the way that the Red Army fought. Designed to be easy to use, lethally destructive and with year-round reliability, the Soviet SMGs were the ideal vehicles for maximizing the relationship between manpower and firepower. Yet in testimony to the quality of the design, these weapons served well beyond World War II. Not only did they stay in the hands of Soviet and Eastern Bloc armies into the 1950s, they were also wielded by the Chinese and North Koreans during the Korean War (1950–53), and Viet Minh, Viet Cong and North Vietnamese Army (NVA) fighters during the Indochina and Vietnam Wars (1945–75). The PPSh-41 has been found in the hands of insurgents in Iraq since 2003, likewise in Afghanistan since 2001, and modern semi-auto versions are available to purchase in the civilian markets.

Given this longevity, and the human damage the Soviet SMGs of World War II have left in their wake, it is clear that they deserve the respect of any firearms historian.

# DEVELOPMENT

## Guns for the masses

Although SMGs emerged during World War I, at first with the Italian Villar-Perosa and later, more effectively, with the German MP 18/I, the Soviets were relatively slow to buy into the submachine-gun concept. The tried and tested firearm of the humble Soviet infantryman was the Mosin-Nagant 1891 (and variants thereof), a bolt-action rifle firing a 7.62×54mmR cartridge from a five-round non-detachable magazine. At 1,232mm long (for the basic M91/30 version), the Mosin-Nagant was not entirely practical for new post-World War I generations of soldiers, such as armoured troops or combat engineers, even in the rifle's carbine version. Thus in the 1920s, by which time the imagination of the world's firearms designers had been caught by the Thompson SMG in the United States, the Soviet arms industry began to play around with the SMG designs.

### EARLY MODELS

The first such gun to emerge was the Model 1926 Tokarev, designed by legendary Soviet firearms designer Fedor Vasilievich Tokarev (1871–1968). (Tokarev has a number of great weapons to his credit, particularly the TT-30 and TT-33 semi-auto handguns – the latter the Soviet Army's first semi-auto standard sidearm – and the later SVT-38 and SVT-40 automatic rifles. Yet all of these were predated by the Model 1926.) In 1910 Tokarev had experimented with a semi-auto conversion of the Mosin-Nagant rifle, but this was a dead end. The Model 26 was no more successful, but it augured of things to come, and introduced Soviet thinking to SMGs.

The Model 26 was an odd-looking weapon, the most curious feature being a curved 21-round magazine projecting down in front of the trigger

A Soviet parade sees ranks of soldiers present their PPD-40s. The PPD-40 is visually distinguished from the earlier PPD-34/38 by its recessed magazine housing. (Cody Images)

guard. This magazine held rimmed 7.62×38mmR Nagant cartridges, the round also used in the Nagant M1895 revolver. (The rimmed cartridge necessitated the curved magazine profile.) It was a blowback weapon with a brisk cyclical rate of 1,100–1,200rds/min, meaning that the magazine could be emptied in little more than a second. The gun was also selective fire by means of two triggers, one for semi-auto fire and one for full-auto. Total weight was 2.8kg.

The Model 26 was an experimental weapon only. Its rather complicated design and unsuitable cartridge meant that it performed poorly in trials, and did little to persuade the authorities that the SMG was the way of the future. It would take the efforts of another great gun designer, Vasily Alekseyevich Degtyaryov (1880–1949), to persuade them otherwise. In the early 1930s, Tokarev, Degtyaryov and another gunmaker, Sergey Korovin, all put their minds to SMGs. It was a Degtyaryov design that won through, known as the Degtyaryov PPD-34. (PPD stands for *Pistolet-Pulemyot Degtyaryova*, or Degtyaryov Machine Pistol.) Here was a far more convincing SMG, owing much of its design to that of the German MP 28/II. Again working from blowback principles, and firing from an open bolt, the PPD-34 was another selective-fire weapon (although with a single trigger), which fired at a more controllable 800rds/min. It had a simple wooden one-piece stock and forend, a ventilated barrel jacket to encourage cooling and a blade front sight aligned with a 'U' notch rear sight adjustable from 50m to 500m in 50m increments. The 25-round curved box magazine this time held the new 7.62×25mm Tokarev pistol cartridge, although it could also take the 7.63×25mm Mauser round on which the new cartridge was based. However, the subsequent PPD-34/38 model not only brought design changes such as a new barrel jacket, but also a different feed – a 71-round drum magazine. This magazine was actually based largely on the magazine of the Finnish KP/-31 Suomi SMG (about which we shall say more later), and when filled with rounds was a bicep-building addition to the gun – the box magazine weighed 0.45kg while the drum magazine was just under 2kg in weight. Nevertheless, the PPD-34/38's magazine capacity meant that the user could deliver significant sustained bursts between magazine changes.

The PPD-34/38 worked appreciably well, not least because its manufacture relied purely upon solid machined parts – the age of crude metal stampings had not yet arrived in Soviet firearms production. Its bore was also chrome lined to resist wear. The performance of the PPD-34 was sufficient that the gun was put into manufacture for Soviet Army use, but only distributed to a very few specialist users, such as border guards or NKVD internal security troops. Indeed, a total of just 4,174 PPD-34s

The Finnish 9mm Suomi SMG, here seen in post-war use, was an exceptional firearm that directly influenced the Soviet development of the PPD-40 and the PPSh-41, particularly in terms of the 71-round drum magazine. (Cody Images)

and PPD-34/38s were made prior to 1940. The fact was that the Soviet authorities were generally none too keen on distributing rapid-fire weapons to the humble infantryman, seeing such a policy as little more than a good way to accelerate ammunition consumption.

It would take war to galvanize Soviet investment in submachine-gun technology. In November 1939, the Soviet Union invaded Finland. Although the invasion ultimately ended in a victory, of sorts, for Stalin, the road to that goal was a harrowing one that showed the acute limitations of Red Army tactics and leadership. In appalling arctic conditions, Soviet infantry units were regularly outclassed by determined Finns, who utilized the close-range firepower of the Suomi SMG to terrible effect. (See next chapter for a more in-depth analysis of this conflict.) Now convinced of the potential of SMGs, the Soviet ordnance authorities looked towards mass-produced full-auto weapons as the future of its army.

A young partisan speaks with Soviet security forces. The two men in foreground are armed with PPD-40 SMGs. Production of the PPD weapons was limited, as the quality of its construction meant it was principally a peacetime weapon. (Cody Images)

The first stage in this development was a reworking of the PPD-34/38, in the form of the PPD-40. The PPD-40 was essentially a PPD-34/38, but rationalized for the needs of mass production – in total *c*. 90,000 were manufactured at the Sestroryetsk and Tula Arsenals in 1940–41. From the outside, immediate differences in the PPD-40 from its predecessor were a redesigned barrel jacket (fewer, longer ventilation slots) and a separate stock and forend, divided by a deep magazine housing. The drum magazine was also modified. Internally, the receiver needed some internal modifications to allow for the new layout.

Apart from these changes, the PPD-40 was essentially the same practical weapon as its predecessor, a blowback-operated, 800rds/min,

selective-fire SMG. Yet despite the rationalization of the design, the PPD-40 was still too complicated for the mass production requirements of total war. The PPD-40 remained wedded to expensive machining processes, at a time when other combatants were fielding weapons that relied heavily on metal stamping. Guns such as the German MP 40 and the British Sten gun were cheap and fast to make, and were therefore ideal for providing a mass infantry with front-line firepower. The PPD-40 was not the Soviet equivalent.

In June 1941, Germany invaded the Soviet Union in Operation *Barbarossa*. The first seven months of the conflict saw the Wehrmacht inflict a series of epic defeats upon the Soviet armed forces, the magnitude of which was only endurable because of the scale of Soviet manpower and industry. Although the Germans were eventually stopped in the suburbs of Moscow, courtesy of a paralyzing Russian winter and the strategic redeployment of Red Army troops from East Asia, it was clear that something of a revolution had to occur within the military infrastructure if Stalin was to take on Hitler's disciplined and combat-hardened troops. Furthermore, as the Germans swarmed over Belorussia, the Baltic States and Ukraine, large areas of industrial facilities and huge numbers of small arms, including PPDs, fell into German hands. Thankfully for the Red Army, one Georgy S. Shpagin (1897–1952) was hard at work from 1940 developing an alternative to the PPD-40.

## THE PPSh-41

Shpagin was a classic representative of the socialist system. From peasant stock in the Kovrov region, Vladimir Oblast, he served in the Soviet Army from 1916. Talents with engineering meant that Shpagin first worked in a regimental weapon-repair unit, then (after the 1917 Revolution) as an armourer. From 1920, now a civilian, Shpagin became a machinist in a weapon factory, alongside the likes of Fedorov and Degtyaryov.

A PPSh-41 with its top receiver cover hinged forward and the bolt assembly removed. In this position the chamber of the gun is exposed, making it easily accessible for cleaning the chrome-lined bore. (Gunpics)

Shpagin's career not only gave him an instinctive understanding of how firearms worked, but also exposed him to foreign firearms. Thus from the early 1920s, he began to turn his hand to weapon design rather than just maintenance. Between 1922 and 1938, Shpagin's main efforts were directed towards the design of light and heavy tank machine guns, working with Federov and Degtyaryov, but in the summer months of 1940 he began to focus on a new SMG, the prototype of which was ready in August. Shpagin designed the weapon with frugal mass production in mind, relying heavily on stamped metal parts fixed together through cheap welding processes. This not only meant that guns could be produced quickly in large-scale factories, but also that they were more suited to manufacture in small industrial units, dispersed in secure locations around the country.

After an extended period of testing, Shpagin's 7.62×25mm weapon was submitted to competitive submachine-gun trials in October 1940. It was not the only weapon in the running.

Degtyaryov and another Russian gun designer, Boris Gabrielovich Shpitalny (1898–?), also contributed prototype weapons for the competition. Although history now knows that the PPSh-41 – Shpagin's design – ultimately triumphed, the trials were far from one-sided.

The Shpitalny gun offered a higher muzzle velocity and a significantly greater accuracy that the Degtyaryov and Shpagin offerings. (Gebhardt (1996: iv) states that the Shpitalny had 71 per cent greater accuracy than the Degtyaryov and 23 per cent greater accuracy than the Shpagin.) There was nothing to choose between the weapons in terms of rates of fire (*c.* 900rds/min), and all performed well when delivering intense automatic fire. Yet where the Shpagin design set itself apart was in terms of manufacture, reliability and maintenance.

The 71-round drum magazine significantly reduced reloading times for the Soviet submachine-gunner. When filled with 7.62mm cartridges it weighed 1.84kg. (Gunpics)

Looking at manufacture, the Shpagin gun required a total of 87 factory parts, as opposed to the 95 used by the Degtyaryov and the Shpitalny, with many of these parts being stamped, including the entire receiver and barrel-jacket assembly. Furthermore, based on mass-production processes, it would take 25.3 machine hours to make a Shpitalny, 13.7 hours to make a Degtyaryov, but only 5.6 hours to churn out a Shpagin gun (Gebhardt 1996: v). With the Soviet Union under intense pressure to produce weapons in the hundreds of thousands, the significant time savings offered by the Shpagin really mattered. Furthermore, the trials had shown that the Shpagin was one of the most reliable designs under probing field conditions, plus field stripping and cleaning were simple affairs capable of being mastered by the least sophisticated of infantrymen.

All in all, the Shpagin presented a compelling combination of advantages, and it was adopted as the 'Submachine Gun of the Shpagin System, Type 1941' by the Defence Committee of the Council of People's Commissars on 21 December 1940, manufacture beginning in the autumn of 1941. In testimony to its suitability for mass production, by the spring of 1942 Soviet factories were rolling out 3,000 units a day, which resulted in a total wartime production figure of more than five million guns.

A profile view of the PPSh-41, with sling attached and fitted with the 71-round drum magazine. In this configuration, the gun was not light – total weight with the full magazine was 5.4kg. (Gunpics)

This view of the PPSh-41 shows the ventilated barrel jacket and the angular muzzle compensator – built directly into the barrel jacket – to good effect. The front-sight blade is protected by a steel hood. (Gunpics)

The production times were not only spurred by political incentives – local Communist Party members were given responsibility for fulfilling quotas in their district – but also by ingenious repurposing of the materials. For example, it was discovered that a Mosin-Nagant rifle barrel could be cut in half to form two barrels for PPSh-41 guns.

The PPSh-41 was a straightforward blowback weapon, firing again from an open bolt. The firing pin was set in the bolt face, and the power to ignite the cartridge primer came purely from the delivered impact of the bolt powered by the operating spring. This design made the PPSh-41 extremely simple, and hence durable. Beneath the one-piece wooden stock sat the trigger and selector switch, all surrounded by the trigger guard. The charging handle lay along the right-hand side of the receiver, with the ejection port sitting atop the receiver, in line with the magazine housing. The barrel was chrome lined, to make it more resistant to wear – a necessity considering the PPSh-41's scorching rate of fire (900rds/min). As with the PPD, the PPSh-41's barrel was wrapped in a protective and ventilated jacket. One ingenious, and instantly recognizable, feature of the jacket is its angular cut at the muzzle. This served as both compensator (reducing muzzle rise during full-auto fire) and muzzle brake (reducing recoil). Although this feature had the by-product of increasing muzzle blast, it was still welcome in a fast-firing gun that needed controllability.

The bolt group of the PPSh-41. The charging handle projects from the side, and the operating spring with buffer are seen to the rear. The sides of the bolt featured recesses to collect excess lubrication or foreign bodies. (Gunpics)

One particularly thoughtful aspect of the PPSh-41's design was that the receiver and barrel were hinged just in front of the magazine housing. By pressing the receiver hood forward, the receiver was unlocked and could be hinged downwards, thus exposing the bolt and operating spring for easy removal and cleaning. This simple process was a godsend for front-line combat troops, as it removed the need for fiddly maintenance involving complex disassembly steps.

With the PPSh-41, there were two magazine options during the war period. The first was the 71-round drum magazine, which although providing the user with a considerable reserve of ammunition, brought with it some problems. Not only was it a sapping weight to hang from the middle of the gun, affecting a weak-armed user's ability to aim the weapon accurately, it could also be unreliable, and fail to feed. It was also an ordeal to reload such a magazine in combat, and it soon became clear that the complex magazine was not entirely in keeping with the simple philosophy of mass production. For this reason, the State Defence Committee ordered the development and production of a simpler 35-round box magazine. The quicker reloading times and more convenient weight made the box magazine a sensible move, although the sheer volume of bullets in the 71-round drum meant that it would remain popular with troops throughout the war. In 1942–43, however, the first generation of such magazines were produced in a metal too flimsy (0.5mm) for the hard knocks of front-line use, resulting in damaged magazines and the accompanying jams and stoppages. From November 1943, therefore, the magazine walls were increased to 1mm thickness, making a significant improvement in feed reliability.

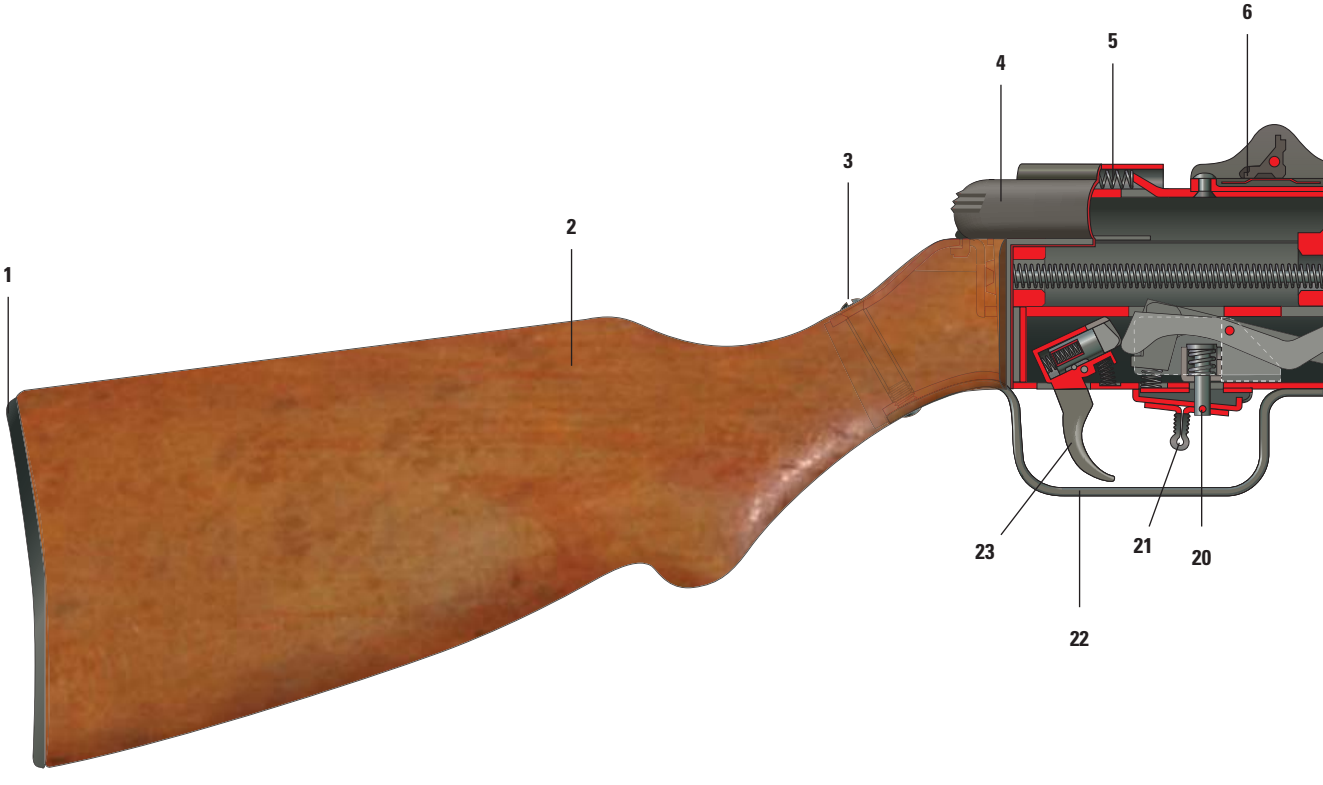
In this view of the PPSh-41, we clearly see the barrel running through its protective jacket, and the ejection port is visible on the top of the receiver. Removing the barrel from the jacket required separating the barrel housing from the receiver. (Gunpics)

The sights on the PPSh-41 were basically produced in two configurations, which are typically used to distinguish between the 'Early' and 'Late' models of the PPSh-41. The Early Model (1941–42) rear sight was a tangent sight similar to that described above for the PPD, again working in graduations of 50m, from 50m to 500m. However, from 1942 the continual process of rationalization resulted in this sight being replaced

The PPSh-41 with its receiver hinged open for cleaning. Here we also see the bolt and operating spring with buffer, plus a 71-round drum magazine in its dismantled state, showing the circular magazine spring inside. (Gunpics)

## THE PPSh-41 EXPOSED

### 7.62×25mm PPSh-41




**1.** Butt plate
**2.** Butt stock
**3.** Butt stock screw
**4.** Hood
**5.** Hood spring
**6.** Rear sight
**7.** Charging handle
**8.** Receiver cover
**9.** Bolt
**10.** Ejection port
**11.** Cartridge in chamber
**12.** Barrel
**13.** Barrel housing
**14.** Front sight
**15.** Front sight guard
**16.** Muzzle compensator
**17.** Rear barrel block pin
**18.** Cover latch
**19.** Drum magazine
**20.** Selector plunger
**21.** Selector switch
**22.** Trigger guard
**23.** Trigger
**24.** Operating spring and guide rod
**25.** Firing pin
**26.** Extractor
**27.** Receiver hinge pin
**28.** Magazine follower
**29.** Follower screw
**30.** Volute chamber
**31.** Magazine latch spring
**32.** Magazine latch
**33.** Trigger bar/sear
**34.** Interruptor
**35.** Trigger bar/sear spring
**36.** Trigger spring
**37.** Trigger bar connector spring

## PPSh-41 specifications

**Cartridge:** 7.62×25mm Tokarev

**Type of operation:** Blowback

**Length:** 828mm

**Barrel:** Four grooves, right-hand twist

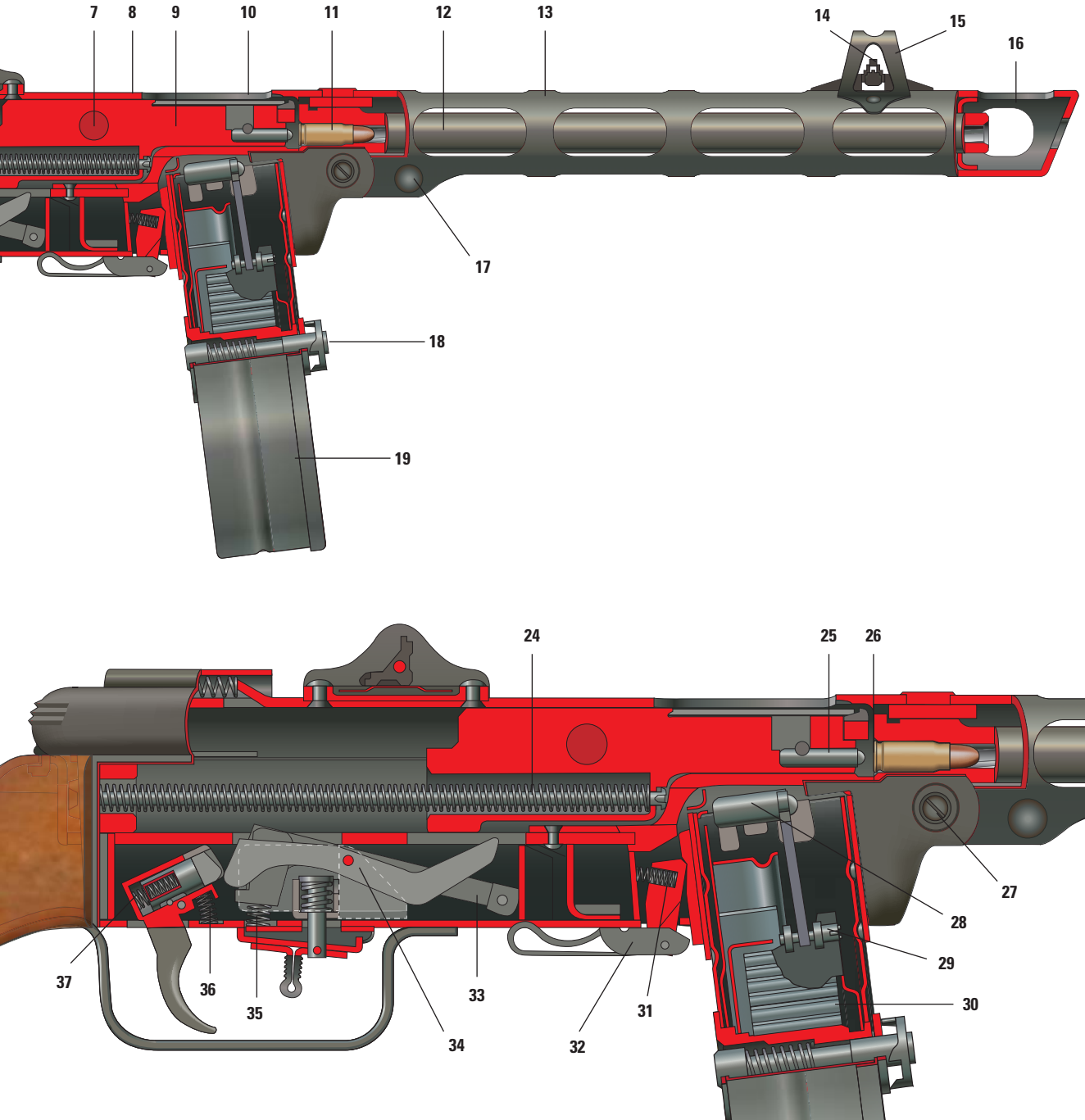
**Barrel length:** 265mm

**Weight unloaded:** 3.64kg

**Feed mechanism:** 35-round detachable box or 71-round drum

**Weight of loaded magazines:** Box type 0.68kg, drum type 1.84kg

**Sights:** Tangent with open 'U' notch, adjustable 50–500m; later models, open 'U' notch 'L' flip rear sight set for 100m and 200m



by a flip-type aperture sight. Here the sight was calibrated to ranges of 100m and 200m (the sight actually bears the numbers '10' and '20'), and the aperture piece rotated to allow the soldier to switch between ranges. Not only did this new sight further simplify production processes, it also acknowledged the realities of the PPSh-41's practical combat range and reduced the decision-making on the part of the front-line soldier.

Various other modifications were made to the PPSh-41 during the war. These included a welded front-sight guard (replacing the original tension-mounted guard), improved magazine catch (early guns had an unnerving tendency to drop the magazine during intensive firing), and a new textile-and-leather bolt buffer, replacing the fibre-composite version. Some later versions were also configured for automatic fire only. Interestingly, Shpagin produced two other versions of the PPSh-41. The PPSh-2 had a pistol grip, curved box magazine and shorter barrel housing, and was full-auto only (Gebhardt 1996: vi). The wooden stock was also removable, making it more convenient to stow inside vehicles or other awkward spaces. (More about the PPSh-2 is discussed below, in the context of the PPS trials.) Another trial weapon, developed in 1945, had a 'boxed-shaped barrel housing and a wire stock' (Gebhardt 1996: vi). Given that by this point the Red Army was well-served by both the PPSh-41 and the PPS weapons, it comes as little surprise that neither of these two weapons went into production. At the more outlandish end of the scale, in 1945 we see an experimental curved-barrel version of the PPSh-41, along similar lines to the German *Krummlauf* attachment fitted to the StG 44. It was intended to allow the user to fire around corners or cover while remaining safely out of the line of fire, but given that the *Krummlauf* was a barrel-melting failure, it is little surprise that the Russian attempt quickly slipped into obscurity.

## THE PPS

As good as the PPSh-41 undoubtedly was, the continuing war with Germany quickly compelled a rethink of the Red Army's small-arms needs. Shpagin's attention to mass production meant that the PPSh-41 was a seminal leap forward compared to guns like the PPD, but the fact remained that by 1942 the Soviet ordnance authorities were still looking for ways in which submachine-gun output could be streamlined even further.

A profile photo of the PPS-43, with the sling attached and the metal stock in its folded position. The stock was typically folded for storage and convenient carrying. (Gunpics)

Another problem with the PPSh-41 was that its layout involved a fixed wooden stock. While this was well-suited to the robust knock-about life of the infantryman, for specialist troops such as engineers, armoured vehicle crews and reconnaissance troops, the 836mm overall length of the PPSh-41 still

A right-hand side view of the PPS-43, showing clearly the cocking handle running along the side of the receiver, plus the ejection port just above the magazine housing. Note the large safety lever in front of the trigger guard. (Gunpics)

proved to be something of a problem in terms of storing and carriage. The gun was also undeniably heavy – 3.64kg even without filling the drum or box magazine with cartridges.

Thus it was in 1942 that criteria were issued for the design of a new SMG. The limitations placed upon the design were demanding:

- Weight limited to 3kg
- Majority of parts made from 2–3mm hot-rolled steel stampings
- Milling work for each weapon kept to a limit of 3–3.5 hours
- Metal wastage during production limited to 30–40 per cent
- Rate of fire limited to 400–500rds/min.

The Soviet Union's best gun designers, including Degtyaryov, Shpagin, Korovin and A.I. Sudayev, set about addressing the challenge. Trials of the weapons submitted began on 25 February 1942, and ran intermittently until July. Shpagin's contribution was the PPSh-2 outlined above. In contrast to the PPSh-41, however, Shpagin's new attempt did not fare well in the trials process. It proved to be inaccurate when fired in full-auto mode, and it was still too long and too heavy for specialist personnel.

A top view of the PPS-43, with the stock folded down over the receiver. Note how the skeleton butt wraps around the rear sight – this allowed the gun to deliver aimed fire even when the stock was folded. (Gunpics)

**Partisans, Belorussia, 1944 (opposite)**

Three partisans, deep in a forest in Belorussia in the spring of 1944, set about stripping and cleaning their submachine guns. The man on the left is removing dirt from the bolt of his PPS-43. The main body of the gun lies on a cloth in front of him, with its top cover open and magazine removed; standard-issue Russian cleaning rods are also on the cloth. In the centre, the partisan is removing the bolt group of his PPSh-41, with the return spring still attached. A twin cap bottle rests on the log nearby – one side of the bottle contained a cleaning solution, the other side held a light gun oil. The 71-round drum magazine is seen with its cover removed, having just been filled with 7.62mm cartridges, wound against the tension of the magazine spring. On the right, the partisan is cleaning the vented muzzle cover of the older PPD-40. In front of his pack, next to the PPD's drum magazine, are various items of cleaning kit: a pull-through cord, oil bottle and maintenance tool. The Soviet SMGs were ideal for partisan use, requiring little maintenance to stay functional, even in places far from logistical and engineering support. See pages 25–28 for more on Soviet SMG maintenance.

Furthermore, while other designs went with a practical folding metal stock option, the removable stock of the PPSh-2 was not suited for the exigencies of combat. Shpagin's case was probably not helped by submitting his design late to the trial proceedings.

Degtyaryov's submission was far more on the money. It included a simple open-bolt mechanism, full-auto only, and a lockable charging handle to protect against accidental discharges. Most distinctly, it was fitted with a folding metal stock. Yet it was the weapon submitted by Sudayev that really started to grab and hold the attention of the trials staff. First tested between 26 April and 12 May 1942, the gun was again open-bolt blowback, with a full-auto-only trigger mechanism and an extremely economical use of metal both in the receiver and barrel cover and the folding metal stock. With the stock extended the gun measured 889mm overall, but fold the stock down underneath the receiver and total length dropped to 635mm, an ideal length for storage.

The gun was effectively a tribute to the processes of metal stamping and welding. Just 2.7 hours of machining were needed to make a PPS and only 6.2kg of metal – less than half that required for the PPSh-41. Gebhardt notes that:

> The Sudayev design used half as much metal and took almost one-third less time to make. This meant that for the production program at the July 1942 level (135,000 units), when the PPS was approved for production, the replacement of the PPSh-41 by the PPS offered a monthly saving of 1,000 to 1,100 tons of metal and a reduction in machine time and man hours of 55 to 60 percent. Over the course of 5 to 6 months, the existing productive resources could produce up to 300 to 350 thousand submachine guns per month without additional resource expenditure. (Gebhardt 1997: v)

With the top receiver cover hinged forward, the PPSh-41 user had extremely easy access to the bolt assembly inside. No tools were required; the user simply pushed on the rear hood of the receiver to open the weapon. (Gunpics)

This close-up of the PPS-43's magazine housing highlights the cheap construction materials and manufacturing processes used in the gun, although these did not make the weapon any less reliable. (Gunpics)

The case for the PPS was compelling, and it was approved for production by the State Defence Committee in late July 1942. The actual conditions of its early production run are historically fascinating. By this point in the war, the city of Leningrad had been under siege since 8 September 1941, the city's population reduced to starvation levels of nutrition and raw materials in the city's factories falling to critical levels. The PPS-42, as the first model of the weapon was known, was put into production at the nearby Sestroryetsk Arsenal, with the initial production models becoming available on the Leningrad Front in December of that year.

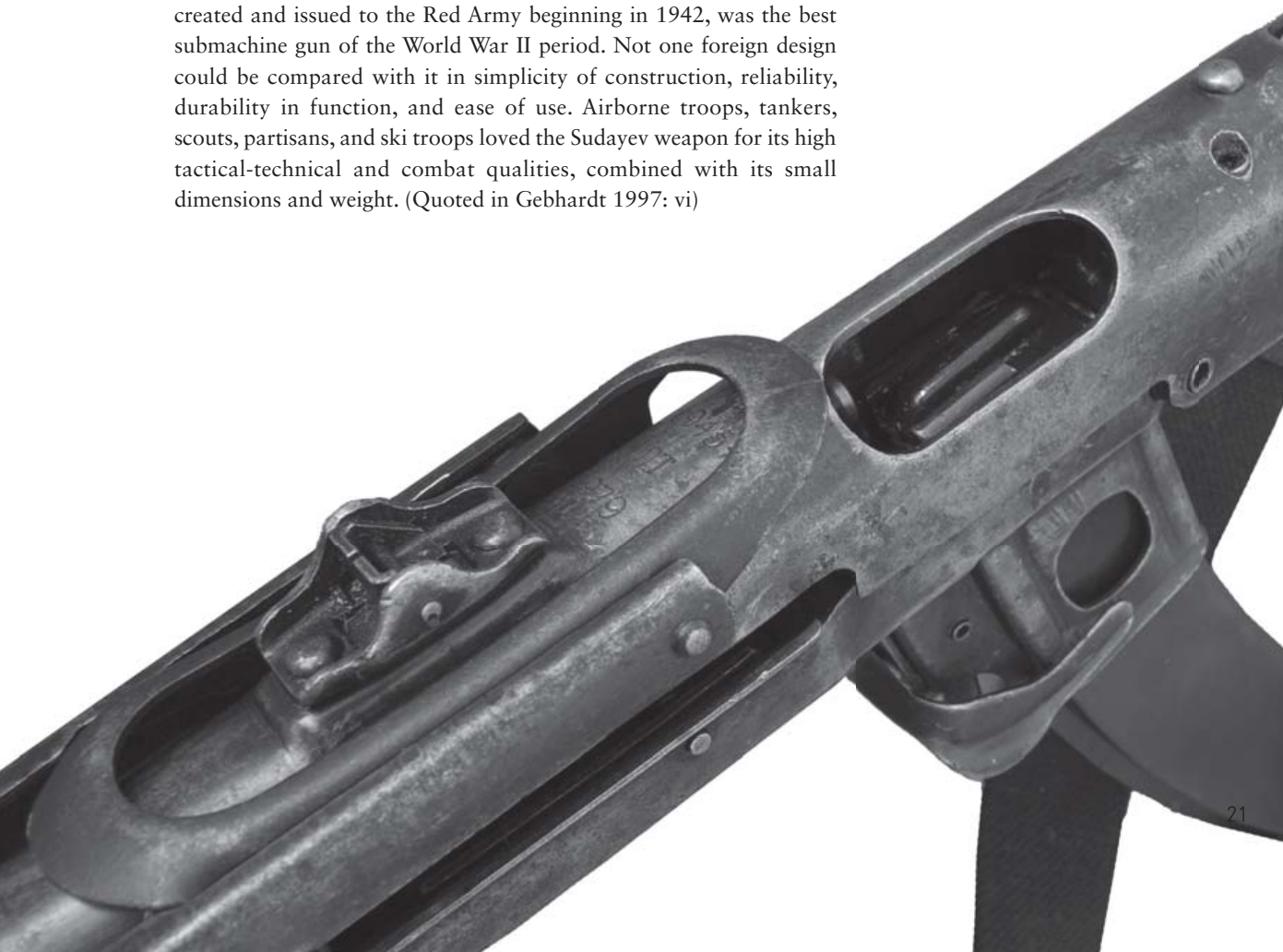
Women in a Soviet workshop assemble PPSh-41 SMGs. A virtue of the PPSh-41 was that its simple construction meant it could be made in small engineering units rather than large factories. (Cody Images)

During 1943, a total of 46,572 PPS-42s were produced, and the intense fighting on the Leningrad Front provided a grim but ideal testing ground for the new weapon's capabilities and reliability. The battle reports, plus feedback from the manufacturing plants, resulted in design changes to the weapon in 1943, the new PPS-43 model going into production in the mid-part of the year. Changes from the original model included the following:

- Improved safety mechanism
- Reduced overall length (shortened barrel and stock)
- A magazine housing with a greater forward angle, to facilitate easy magazine changes
- Rubber pistol grip pieces, rather than the wood used on the PPS-42
- Larger-diameter operating-spring guide rod
- Impregnated fibre buffer
- Redesigned muzzle brake.

Thus redesigned, the PPS-43 was a near-perfect weapon, and nearly two million were manufactured between 1943 and 1946. If there is any doubt as to its integrity, we need only look to the words of Mikhail Kalashnikov, himself the designer of the world's most successful firearm:

> It can be said in all seriousness that A.I. Sudayev's submachine gun, created and issued to the Red Army beginning in 1942, was the best submachine gun of the World War II period. Not one foreign design could be compared with it in simplicity of construction, reliability, durability in function, and ease of use. Airborne troops, tankers, scouts, partisans, and ski troops loved the Sudayev weapon for its high tactical-technical and combat qualities, combined with its small dimensions and weight. (Quoted in Gebhardt 1997: vi)



Here we look down into the ejection port of the PPS-43, with the bolt drawn back to its rearmost position ready for firing. During firing, the empty shell cases are ejected up and to the right. (Gunpics)

The basic muzzle compensator of the PPS-43, made from a single piece of pressed steel, helped to keep the muzzle down during full-auto fire, although very long magazine-emptying bursts were rarely recommended. (Gunpics)

## FOREIGN USERS AND POST-WAR DEVELOPMENT

Given the quality of design in the Soviet SMGs of World War II, it was inevitable that their use, and to some extent their development, would not end with the conclusion of the war in 1945. The PPD did not have a particularly influential presence after 1945. The Finns – who utilized stocks of captured wartime Soviet small arms – had supplies of PPDs until the 1960s, and issued some to reserve or coastal troops. PPDs were also seen in the hands of Albanians, North Koreans and even, through the snaking supply routes of the Cold War, Philippine insurgents during the Hukbalahap Rebellion (1946–54).

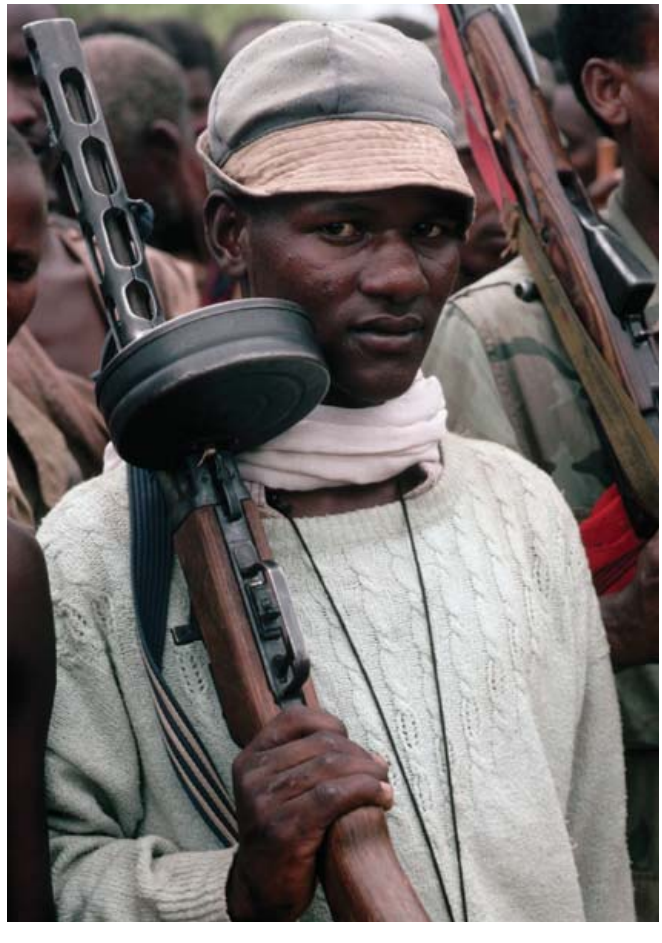
The PPSh-41 had a far more distinguished post-1945 service, seeing action in the hands of more than 20 nations as diverse as Albania, Finland, Guinea, Mongolia, Vietnam and Zimbabwe. In Soviet and Eastern Bloc forces, it continued in service well into the 1950s, until the AK-47 steadily removed the rationale for a standard-issue SMG. It was, however, a standard weapon of both the North Koreans and the Chinese during the Korean War

(1950–53), and the huge numbers of Soviet-supplied weapons were supplemented by locally produced copies. In North Korea this was the Type 59, which only took drum magazines; in contrast, the Chinese Type 50 only took box magazines. One particularly interesting variant was the Vietnamese K-50M. The K-50M, at first glance, looks quite dissimilar to the PPSh-41, with a telescoping metal stock, a pistol grip and a barrel without a jacket. Nevertheless, the K-50M is actually a conversion of the Chinese Type 50, of which large numbers were supplied to the Vietnamese by the Chinese during the 1960s. Unlike the Type 50, the K-50M could take both box and drum magazines, the latter only if the telescoping stock was extended.

The PPS weapons also had a decent post-war lifespan. It was licence-produced in both Poland (as the M1943/52) and China (Type 54); the Poles also produced a training variant in .22 Long Rifle rimfire calibre. The Finns embraced the PPS during World War II, through captured Soviet stocks, and in 1944 Finland put into production its own indigenous version, the M44. This was a cheap and cheerful copy of the PPS, but in 9mm Parabellum calibre, hence able to use the magazines of the Finnish Suomi SMG. (In the early 1950s, the gun was modified slightly to take the Swedish M45 Carl Gustav magazines.) The M44 became the standard SMG of the Finnish armed forces, and it was also produced by the Spanish as the Dux M51 (the M44's designer, Willi Daughs, emigrated to Spain soon after the war). Ironically, this design would also circulate into German use. Samples of the M51 were given to the German Border Police for testing during the early 1950s. The tests proved positive, and so the Border Police ordered 1,000 to be produced for them by the Oviedo Arsenal in Spain, the new weapons termed the M53. Again, these firearms were made in 9×19mm Parabellum, and they were finished to better standards than the Soviet or Finnish weapons, hence remaining in service well into the 1960s.

The international prevalence of PPSh-41 and PPS SMGs ensured that they would go on killing people well into the Cold War and beyond. Indeed, recent hauls of insurgent weapons in Iraq often bring up stocks of time-jaded but still functional examples of these guns. Applied with proper tactical consideration, they remain devastating weapons into the 21st century.

**OPPOSITE**
Like the PPSh-41, the PPS-43 had a receiver that hinged in front of the magazine housing. This design made the gun very easy to strip and clean, and reduced the risk of losing an important part. (Gunpics)



A Somali militiaman in 1992 brandishes his PPSh-41. Large numbers of Soviet and Eastern Bloc PPSh-41s were distributed to African nations during the post-colonial conflicts of the 1960s and 1970s. (© Peter Turnley/CORBIS)

# USE
## Firepower on the Eastern Front

The Soviet Union during World War II bought into the submachine-gun concept with a commitment often unmatched by opponents and allies. It is striking to note, for example, that SMGs constituted a total of 34 per cent of the total number of rifles and SMGs produced by the Soviets during World War II; the equivalent figure for the Germans was just 11 per cent. Ultimately, as we shall see, whole Soviet battalions and regiments came to be equipped with SMGs, giving them a ferocious firepower advantage. Before looking at the tactical deployment of the Soviet SMGs, however, it is worth taking an overall look at what brought the PPSh-41 and PPS weapons such a robust reputation in the field.

In a striking image of the German defeat, a Red Army unit guards a column of German prisoners in April 1945. The soldier at the front has a PPS-43, while those further back have PPSh-41s. (Cody Images)

## OPERATION AND MAINTENANCE

The PPSh-41 was a straightforward weapon to use, even for those with almost no prior contact with anything more sophisticated than agricultural implements. To load the weapon, a magazine was inserted into the well of the receiver, and pushed up until the magazine catch engaged with the lug in the magazine. The safety lever was pushed to the right, the action of which freed the bolt to move, and then the charging handle was drawn back and released. At this point the bolt stopped in an open position; with its firing rate of *c.* 1,000rds/min, the PPSh-41 was necessarily an open-bolt weapon, as a closed-bolt configuration would not only make the weapon more expensive to manufacture, but it would also raise the risk of round 'cooking off' (accidentally discharging) in a heated chamber. The selector mechanism was then set to either semi-auto or full-auto fire, and the trigger was pulled.

The war on the Eastern Front was especially hard on small arms, the severe range of climatic conditions, and the sheer filth of the front line, making sophisticated weapons prone to jamming from the intrusion of dirt, ice and snow, or from rusting of parts. The PPSh-41 was durable in the extreme, its very simplicity and a certain looseness in the bolt making it a gun relatively tolerant of foreign bodies. All guns jam, however, and the official 1955 manual for the PPSh-41 (fortunately translated by James F. Gebhardt) gives timeless instruction:

> **Measures for preventing stoppages during firing.** To prevent stoppages during firing, one must:
> 1) Strictly observe the regulations for preservation, disassembly and assembly, cleaning, lubrication and inspecting the submachine guns.
> 2) During prolonged firing, after 500–1000 shots conduct partial disassembly of the submachine gun, remove the powder residue and congealed lubricant from the working parts, lightly lubricate, and reassemble the submachine gun.

**BELOW LEFT**
Rear view of the PPSh-41. The circular cap in the butt plate provided access to a repository inside the wooden stock, in which cleaning accessories were kept. (Gunpics)

**BELOW RIGHT**
The internal parts of the 71-round drum magazine. To load the magazine, the front cover was removed, the spring was tightened by holding the dogs of the drum and rotating the drum anti-clockwise for eight clicks. The cartridges were then inserted into the feed channels, before the spring pressure was released (by pressing the magazine latch knob) to put the cartridges under tension. The magazine cover was then put back in place and the drum was ready for loading. (Gunpics)

If the combat situation does not permit disassembly of the submachine gun, remove the magazine, place the selector on full-automatic mode, and liberally dampen the bolt with kerosene or liquid axle grease through the receiver window. Then press the trigger, and cycle the bolt back and forth several times in order to dissipate the congealed lubricant and propellant residue.
3) During intense firing, take a short break in firing each 150–200 shots to cool the barrel and lubricate the chamber or top-most cartridge in the magazine.
4) Carefully protect the submachine gun from contamination (sand, dust, snow, and so on). (Gebhardt 1996: 31)

The reliability of the PPSh-41 is indicated by the large number of rounds fired between partial disassembly and cleaning, especially considering that the ammunition allocation to each soldier might only be in the region of 200 rounds. This being said, the greedy rate of fire meant that the gun could burn through several hundred rounds with relative ease in an intense combat situation. However, the manual also gives instruction for interim cooling and lubrication, roughly about every three to six box magazines or two to three drum magazines. It also provides a ready solution to maintenance if the 'combat situation' didn't allow the luxury of taking a gun apart – kerosene and axle grease injected directly into the receiver and the bolt worked vigorously backward and forward. (The correct proportions of this mixture were 20 per cent axle grease and 80 per cent kerosene.)

The Soviets were also masters at developing appropriate winter lubricants, a lesson that the German forces had to learn with difficulty during the cruel winter of 1941–42. A US Army report, issued in 1942, made careful note how the Red Army coped with the extreme sub-zero temperatures, especially in relation to weapons lubrication:

In the Mozhaisk area, around which the fighting described below took place, snow was lying about 3 feet [0.9m] deep in the open, and slightly more in the forest. The weather was very cold, with temperatures sometimes reaching -40 degrees Centigrade (-40 degrees Fahrenheit) ... The Russians lubricated all their weapons with oil of a specially thin

On the Eastern Front, a group of partisans armed with the PPS-43 take up positions alongside a Maxim machine gun. The Maxim would comfortably engage targets out to 1,000m, whereas the practical combat range of the PPS was more like 200m. (Cody Images)

> arctic type, and recoil mechanisms were also filled with a special liquid. Water-cooled jackets of machine guns were filled with glycerin. All lubricants used were said to be proof down to at least -50 degrees Centigrade (-58 degrees Fahrenheit). Small arms which gummed up were first wiped entirely dry, lubricated with kerosene, and then fired, before receiving normal lubrication. (War Department 1942a)

**ABOVE LEFT**
Here the receiver of the PPS-43 has been hinged open, exposing the bolt and the operating spring. Note how few working parts are involved in the gun, this simplicity translating into reassuring reliability. (Gunpics)

**ABOVE RIGHT**
The bolt face of the PPS-43, clearly showing the firing pin (in the centre of the cartridge case seat) and the extractor claw. The gun being a blowback design, the bolt was not locked at the moment of firing. (Gunpics)

Again, kerosene features in this passage as a cheap and effective lubricant of small arms. The freezing point of kerosene is -48 degrees Celsius, meaning that it could cope with almost everything the climate could throw at it, even in the deepest Russian winter.

When it did come to disassembling the weapon, the procedure was straightforward. Simply by pressing on the hood at the rear of the receiver, the top of the receiver could be released to hinge forward on the pin in front of the magazine well. Now the operating spring, guide rod, bolt and buffer were easily removed for a quick clean. For more advanced maintenance, the user knocked out a split pin with a special tool, enabling the barrel housing to be removed from the receiver; the barrel could then be separated from the jacket. The trigger housing was released by undoing the tail screw just above the weapon's grip, after which the receiver itself detached from the stock. Reassembly was largely a matter of reversing the instructions. Note that full disassembly was not to be performed on a very regular basis, as it could incur excessive wear and tear on the gun's parts.

The 1955 manual was also clear about the cleaning regimen soldiers should follow, whether in peace or in war. It stated that even a gun that hasn't been used needed to be cleaned at least once a week, and also after any sort of 'training, service, guard duty, or exercises without firing' (Gebhardt 1996: 26). Cleaning immediately after firing was an obvious necessity. A basic field cleaning consisted of wiping the bore and bolt face free from dirt, and lubricating them, while a more extensive clean involved pulling through the barrel with cleaning patches. A typical cleaning kit consisted of an oil bottle, two-section cleaning rod with brush and patch-hold attachments, a drift for punching out retaining pins and a key for sight adjustment.

The cleaning and maintenance guidelines for the PPS were fairly similar, as was the procedure for field stripping. Again, pressing a catch at the back

Clad in winter camouflage, two Soviet soldiers open fire with their PPSh-41s from behind a pile of rubble. The PPSh-41 was in its element during street fighting, the full-auto capability having maximum effect at ranges under 100m. (Cody Images)

of the receiver allowed the gun to be hinged open just forward of the magazine well, exposing the action and allowing the user to remove the bolt, operating spring and buffer. The simplicity and rugged design of the PPS meant that full disassembly rarely had to be performed; indeed the manual actually discouraged this as a regular practice.

Sensing that even a weapon as dependable as the PPS needed respectful handling by the Soviet soldiery, the writers of the manual were keen to point out the need for frequent inspection. Several sub-sections are devoted to this theme, encouraging the soldier to check the weapon constantly for rust, scratches, dents or dirt, and that the bolt, magazine and sights were all in full working order.

Typical causes of stoppages for both guns included heavily fouled chambers (resulting in a failure to extract a spent cartridge), damaged magazines, or excessive dirt or lubrication interfering with the free movement of the bolt. Yet given basic attention, and the unyielding supervision by officers and NCOs, the cleaning regime for the PPSh-41 and PPS SMGs ensured that they would remain in working order and give life-saving service on the battlefront.

## SOVIET USE

The Winter War of 1939–40 came as a profound shock to Soviet military self-belief. Tactically they were outclassed by nimble Finnish infantry units, whose skill in handling both terrain and small arms left the crude mass of Soviet conscripts confused and bloodied. The grievous losses suffered by the Red Army in Finland – a total of 323,000 dead and wounded against around 70,000 Finnish casualties – were a key factor in giving Hitler the confidence to invade the Soviet Union.

The US authorities also made note of the problems suffered by their future ally. A report entitled 'Finnish Tactics – Small Units', published in August 1942, examined just how the Russians came to be so outclassed by their opponents. Intelligent 'channelling' of the enemy through the terrain was central:

> The basic tactical doctrine assumes that the enemy will follow avenues of approach which will make him vulnerable to encirclement, after which his forces are to be destroyed piecemeal. This is accomplished by forcing the enemy to follow routes outlined by either natural or artificial obstacles until he reaches the terrain selected for his annihilation.

> The tactics of annihilation are carried out through the use of a 'motti'. In original usage the word motti means a pile of sawn timber held in position by upright stakes driven in at intervals along its edges. In military usage, motti refers to an enemy group surrounded by Finnish patrols each of from eight to twelve men armed with automatic arms. Lines of communication are severed and the surrounded enemy is decimated by numerous raids, severe cold, and slow starvation. This encirclement may last several months, until the enemy force is completely destroyed … (US War Department 1942b)

The tactic here is very much that of the raider, using small units to chip away at a large force until it collapses from casualties and logistical strangulation. What was also significant about this tactic was that the chief instrument of this tactic was not artillery or air support, but the SMG. The US War Department report clarifies this fact:

> The chief offensive weapon of the Finns is the Suomi machine carbine, similar to our sub-machine gun. Ordinary Central European military tactics demand fire beginning at long ranges in the form of artillery preparation and increasing gradually in intensity over a considerable period of time. Something entirely different is required for warfare in the Finnish woods. Here the weapons must be located far forward and maximum fire power attained immediately. This demands an automatic weapon which is light and mobile. This weapon must be unusually well-balanced to ensure good aim under difficulties incident to forest fighting. The Suomi carbine is the weapon which fulfills all these requirements. (US War Department 1942b)

This Soviet scout is armed with a PPD-38 SMG, a decent weapon but one unsuited to wartime production needs. Unlike the later PPD-40, this gun had a one-piece wooden stock (the PPD-40 had a two-piece stock). (Cody Images)

This passage is important for our analysis here, if only because the Soviets themselves took important lessons from their experience in the Winter War, and applied them to the fight against the Germans. The concept that 'weapons must be located far forward and maximum fire power attained immediately' was one that the Soviets would take to heart. By giving troops significant automatic firepower, in the transportable form of an SMG, the Finns ensured that in close terrain they could achieve an immediate fire superiority against troops laboriously working the bolts of their Mosin-Nagant rifles.

The problems at the heart of Soviet military structure were brutally reinforced from June 1941, with the launch of Hitler's

Soviet troops take a break during the battle of Sevastopol in May 1944. Under the guard of a soldier armed with a Degtyaryov DP machine gun, two of the men are armed with the PPSh-41 while the man on the left has a Simonov AVS-36 6.5mm automatic rifle. (Cody Images)

Operation *Barbarossa*. In just five months of fighting, the Red Army lost more than four million men, including one million dead, as they were outclassed on the battlefield by a combat-hardened army flushed with victory in the West. The Germans demonstrated the intelligent use of combined-arms tactics, plus a handling of small arms (particular machine guns such as the MG 34) that cut swathes through the lines of attacking Soviet infantry.

The Soviet military leadership quickly realized the magnitude of the problem. Its army was a mass force, millions of scarcely trained men forced from manual labour to modern warfare in a matter of weeks. Such was the level of panicked reconstruction during 1941 that more than 400 new rifle divisions were raised, but only 18 were actually fielded. The problem with small-arms distribution was also profound. In January 1939, total official allocation of SMGs to rifle divisions was zero, for a division of 18,841 men. By December 1944, however, the transformation couldn't have been more pronounced. While the actual number of men in an infantry rifle division had fallen to 11,706, the number of SMGs issued was 3,594. This prodigious increase was not only reflected in the numbers of SMGs carried by all units, but also the creation of special units *entirely* armed with SMGs, producing forces capable of delivering tsunami-like close-range firepower.

Within the infantry, a PPSh-41 submachine-gun company was added to each infantry regiment with the new July 1941 Tables of Organization and Equipment (TO&E). This consisted of a seven-man HQ plus three 31-man platoons, each subdivided into three squads. Each squad had two sergeants and eight privates. Whereas these ten men, armed with bolt-action rifles, would have a combined practical firepower of around 150rds/min at best, with the PPSh-41 that firepower could be anywhere from 350rds/min to nearly 1,500rds/min.

Other parts of the Red Army were also beneficiaries of the increased distribution of SMGs. The Soviet Mountain Infantry divisions received a submachine-gun company in 1943, plus one rifle platoon in each company

was issued with SMGs. Tank brigades had submachine-gun companies from December 1941, and with restructuring in November 1943 the brigade also incorporated an entire Motorized Submachine Gun Battalion, which in total brought 280 SMGs to the battlefield, more than half of its 507 personnel being equipped with the full-auto weapons. A classic function of the submachine-gun armed troops within armoured formations was to ride into battle on the outside of the tanks, then leap off to provide the armour with close-range protection against enemy infantry.

So what other factors, apart from the Winter War experience, prompted this massive shift towards SMGs, and automatic firepower in general? There were three principal factors at work. First was the issue of cost. As we have already noted, the PPSh-41 and the PPS were designed to limit the amount of metal and man-hours required to turn out a complete weapon. Even though they had full-auto mechanisms, the SMGs were cheap to produce. Furthermore, the 7.62×25mm pistol ammunition was far less expensive than rifle rounds, using reduced amounts of lead, brass and propellant. The SMGs were also, by virtue of their design, easy to turn out in large numbers at speed – just what the Soviet Union required as it raised huge amounts of new manpower to face the German threat. Small engineering units with the most basic equipment were therefore capable of churning out PPSh-41s and PPS weapons, and production could be distributed away from the large factories that might act as magnets for German bombing raids.

Apart from the cost and production benefits of the new weapons, the SMGs offered the prospect of significantly reducing training times amongst the Soviet soldiery. To train a soldier to use a standard rifle takes time and patience. Rifles are designed for long-range accuracy, which in

In this famous photograph we see the classic mix of Soviet Army firepower – the PPSh-41 SMG serves alongside Mosin-Nagant bolt-action rifles and, at the right, the Degtyaryov DP light machine gun. (Cody Images)

turn requires the soldier to have a knowledgeable control over his breath, muscles, posture and firing position. Furthermore, taking a shot out to several hundred metres requires the soldier to have a reasonable understanding of long-range ballistics, and of how to use his iron sights or optical sights over various ranges. Another issue with the rifle is that the kick of the full-power cartridge requires time spent on the training range to master, particularly in terms of recovery between shots. A hefty kick can also induce a pre-emptive twitch or muscular nervousness – 'gun shyness' – on the part of the shooter, all of which can affect accuracy. The soldier can even develop a bruised shoulder or cheek, common after intensive firing in combat or on the range.

The SMGs delivered several solutions to such problems. They were really only effective out to a range of 200m, well within visual acquisition of the soldier and therefore not requiring complex range calculations, beyond a simple appreciation of lead and drop (see the 'Combat Experience' section below). Second, the felt recoil of the weapons was perfectly controllable with a proper stance and positioning of body weight (leaning into the burst). In semi-auto mode, the soldier could pop out rounds rapidly at point targets, with a negligible recovery time between shots, and therefore little drift from the point of aim. Full-auto fire was also controllable, meaning that the new recruit could achieve a practical gun-handling technique within a matter of days, not weeks, although tactical training would naturally take longer. In terms of fire on target, the SMGs also compensated for the rough edges in the soldier's weapon handling. Rather like the spread of shot delivered by a shotgun, an SMG distributes its impacts across an area rather than on a specific point. With a cyclical rate of fire of 900rds/min, the PPSh-41 could unleash 15 rounds in a one-second burst. The impacts of this one-second burst would be distributed over an area, at 50m range, of about 20×20cm. At 250m the 'zone of effective fire' (as the manual described it) stretched up and out to about 70×70cm. While these figures might represent an unacceptable grouping to a long-range rifle shooter, to the submachine-gunner they provided some compensation for poor weapon control and quite simply maximized

This Red Army infantryman shows near manual-perfect posture for firing the PPSh-41 from a supported position. Note how the hand cups the magazine; the magazine is not placed directly on the ground, where it could be damaged during firing. (Cody Images)

the chances that at least one of the bullets in the stream would find its mark. Even if the shooter's eye was not carefully aligned with the sights, the soldier could try to pull the observed impacts onto the target by 'walking' the bullets onto the point of aim.

This is not to say that anyone could be given an SMG and use it convincingly with little training or tactical awareness. As with any weapon, correct body dynamics had to be taught during training.

## Soviet SMG training

The following is a passage from the US War Department document 'Training of Russian Automatic Riflemen' from *Tactical and Technical Trends*, No. 15, 31 December 1942. Note that the report explains 'The Russian automatic rifleman here referred to is equipped with a weapon comparable to the Thompson submachine-gun'.

> According to a Russian instructional poster, best results are obtained with this weapon as follows: single shot, up to about 300 yards; short bursts, about 200 yards; long bursts, about 100 yards …
>
> The program of training for automatic riflemen is drawn up with special consideration as to their battle functions. The individual training of the automatic riflemen approximates that of the infantry riflemen in the elementary stages. Emphasis is placed on the following:
> (a) Thorough familiarity with the automatic rifle, to include reduction of stoppages and care in the field;
> (b) Marksmanship, to include firing from all positions at stationary, moving, and surprise targets;
> (c) Throwing of grenades and gasoline bottles, especially against tanks, embrasures, and trenches;
> (d) Ability to ski;
> (e) Self-orientation by azimuth, compass, or map at any time.
> In the individual tactical training of automatic riflemen, 8 to 10 hours are devoted to courses in: 'The Automatic Rifleman in Offense,' 'Actions of Automatic Riflemen in Attack and Inside the Enemy Defenses' and 'The Automatic Rifleman in Defense.' Stress is laid upon movement by rushes and crawling noiseless approach to enemy positions, use of camouflage, and utilization of cover. Each trainee must learn the various means of preparing satisfactory fire positions for prone, kneeling, sitting, and standing fox holes. He must also know how to fire from skis and tanks. (War Department 1942c)

## HANDLING

The firing experience of the PPSh-41 on full-auto is blistering. The gun races through the magazine with a ripping sound, but by virtue of the muzzle compensator, and as long as the shooter leans his body weight properly into the shot, the bullet impacts can be kept roughly on target, albeit with the inevitable spread of any SMG. The PPS has a comparatively

sedate 650rds/min rate of fire, making bursts of five to ten rounds perfectly controllable with a good hold on the gun and proper firing stance.

The grip procedures for the two guns vary. With the PPSh-41, the front hand generally rests just in front of the trigger guard, behind the magazine. If the gun is fitted with the drum magazine, the manual also shows that the soldier can place his front hand against the underside of the magazine; when the front elbow is then braced against the knee, chest or an external solid support, this grip is very stable, and suited to more accurate shooting. The PPS is almost invariably held by the front magazine aperture, a stable frontal point under the receiver. Some modern videos of shooters using the PPS show them holding the magazine itself; this practice is not recommended, as it applies stress to the magazine and therefore increases the chances of a misfeed.

A soldier using an SMG has to be familiar with shooting it from a variety of different positions. The PPS manual notes that 'The submachine gunner should accomplish all methods [postures] quickly, not diverting his attention from the target' (Gebhardt 1997: 28). The last point here is central. In fast-moving offensive or defensive operations, the soldier could find himself moving fluidly between locations, adopting various physical positions at each point of firing. These positions had to be expressed instinctively and the weapon wielded rapidly and confidently. Any fumbling to gain a decent grip, or to position a weapon intelligently in relation to cover, could give the enemy a window of opportunity in which to acquire the shooter as a target.

Both the PPSh-41 and PPS manuals taught a similar range of postures for shooting, essentially prone, kneeling, sitting (in various leg positions)

A decorated Soviet soldier holds a PPS SMG across his chest; the muzzle of a PPSh-41 is visible at the left of the picture, showing the clear distinction in muzzle compensator design between the two weapons. (Cody Images)

and standing. The illustrations in the manuals emphasize finding a balanced and stable posture, with the body weight leant into the gun to compensate for recoil. In the case of the PPS, every position would involve firing the gun with its stock extended and with the butt set snugly into the pocket of the shoulder. Having said this, the manual recognizes that in the fast-paced extremities of war (such as in the case of an ambush or surprise attack), the stock might remain folded, and that the weapon could still be fired serviceably in this mode. Both SMGs could be fired controllably from the hip, although the practicality of this measure depended upon the range of target. When shooting on the move, the soldiers were advised to pause briefly if the target was at a distance greater than 100m. In these circumstances, the shooter should stand still briefly, place the stock in his shoulder, fire one or two short bursts or one long burst (to deliver suppressive or destructive fire), then continue onwards. Remember also that this sequence could be performed by numerous men in staggered sequence, meaning that a squad could keep up a steady stream of lead while performing a fire-and-manoeuvre attack. For even more dynamic actions, the soldier could fire the SMG without pause while moving. To prevent an uncontrollable spray of fire, he had to sandwich the stock of the gun against his right side with his elbow. This scenario required sure footing – a stumble on the run while firing full auto could have lethal consequences for the shooter. Running the shoulder strap over the left shoulder aided both control and accuracy, enabling the soldier to apply tension to the gun via the strap and thereby keep a more solid control of the muzzle climb and direction.

Even with good physical control and the low-power ammunition, SMGs inevitably kick and rock while delivering full-auto fire. This behaviour naturally had implications for using the gun from behind or around pieces of cover. Position the weapon incorrectly, and the muzzle could knock against and off the cover, or the cover could obscure target acquisition. Whether prone, kneeling, sitting or standing, the soldier had to position the cover to his left, the object (such as a tree or wall) protecting as much of his torso as possible. The left shoulder and side would ideally lean against the cover, providing physical support, but the manuals are at pains to point out that the gun itself and the left support hand should not touch the cover – doing so would result in the rounds being pushed out to the right as the barrel bounces off the cover object. When supporting the gun from underneath with a solid object, the support was ideally padded with a rolled-up item of uniform, piece of turf or similar soft object, to prevent vulnerable parts of the gun (particularly the magazine) being damaged by repeatedly knocking against a hard surface.

## Ski troops

A distinctive section in both the PPSh-41 and PPS-43 manuals is that regarding the use of the SMGs by ski troops. It is surprising to note, given the winter climate in the northern Soviet territories, that the Red Army actually began the war with no dedicated ski soldiers. The harrowing experience of fighting against the Finns soon taught them the folly of this

Soviet ski troops go into action on the Eastern Front. Note how all are armed with the PPSh-41. This weapon gave them portable heavy firepower for the isolated missions often conducted by such units. (Cody Images)

decision, and by December 1939 the first ski units were crudely cobbled together. During the early 1940s the ski troops were shaped into more coherent battalions (on paper at least), although at first the balance of small arms was weighted towards rifles, both bolt-action and semi-automatic (such as the SVT-38 and SVT-40).

The ski battalions and eventually brigades had, naturally, a somewhat seasonal existence. For example, the second tranche of ski formations were established in October/November 1941, and after service most were disbanded by May 1942 (some battalions in the very far north endured until August or even into the autumn). Yet by the time the Red Army set about forming new ski brigades in September 1942, a more systematic approach to structure and equipment had set in. Also by this time, of course, SMGs had become more pervasive within Soviet forces, and they offered natural advantages to ski troops. The convenient dimensions of the weapons meant that the SMGs could be carried easily on the back, with a reduced risk of snagging on trees and other passing obstacles. The extremely durable nature of the PPSh-41 and, later, the PPS-43 meant that they could be exposed to the freezing, snow-blown conditions endured by the ski troops, and still do their job when required. Finally, and most important, the SMG offered firepower that enabled an isolated unit to punch above its weight in combat. The value of such

weapons becomes clear when looking at the tactical spectrum of Soviet ski patrols, as defined by a US study in January 1943:

> Ski detachments generally operate in the enemy's rear. Existence of gaps in enemy positions, broken ground, and wooded country favor infiltration of ski detachments to the rear of the enemy.
>
> The following tasks are assigned to these detachments:
>
> (1) Destruction of enemy personnel and materiel;
>
> (2) Destruction of enemy staffs and command posts;
>
> (3) Destruction of enemy communications and transport, and the burning of depots and bases;
>
> (4) Destruction of planes on airfields, and demolition of road and railway bridges;
>
> (5) The capture and holding of an important objective in the rear of the enemy, for the purpose of impeding his retreat and the bringing up of his reserves. (War Department 1943a)

The list of tactical demands here is similar to the burden placed upon airborne forces. Like airborne troops, who can only deploy the weaponry that they can conveniently carry, the ski troops had to be able to venture far from main forces but still be able to visit sharp destruction upon the enemy when called to do so. Thus the TO&E of the ski formations became increasingly weighted towards SMGs and automatic weapons in general as the war progressed. By 1943 a ski rifle company (there were three in each battalion, each with seven officers and 129 other ranks) had the following breakdown of armaments:

- 43 × semi-automatic rifles
- 55 × SMGs
- 7 × sniper rifles
- 6 × light machine guns
- 3 × 50mm mortars

In full snow camouflage, and holding mine-detecting equipment, these Soviet sappers are armed with the PPSh-41. The shorter dimensions of the SMGs, compared to the Mosin-Nagant rifle, made the full-auto weapons ideal for engineering troops. (Cody Images)

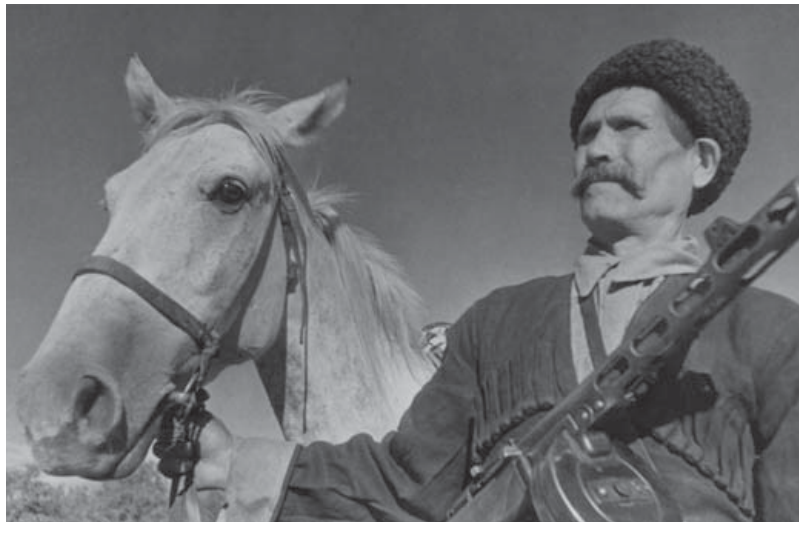
Note how the firepower is balanced roughly equally between the semi-automatic rifles and the SMGs; together with the light machine guns these weapons would ensure that the unit could achieve localized fire superiority against larger German units. The snipers with their rifles could inflict long-range attrition, as well as providing the reconnaissance and surveillance functions delivered by such specialists.

Going back to the manuals, the text offers all manner of ingenious weapon handling for ski troops, utilizing the ski poles as an aid to firing stability. For example, the soldier could fire from the prone position, his skis splayed out behind him while the poles are laid in front, the elbows braced upon the shaft of the poles to prevent the arms sinking in the soft snow. Alternatively, in both standing and kneeling positions the ski poles can be stuck upright in the ground, to act as a grip support for the weapon. Thus the ski trooper could come to a swift stop, and use his ski poles to deliver accurate fire out to ranges of 200–300m.

## Mounted troops

Although all combatants in World War II used horses for logistics, the Red Army was one of the few nations to use mounted cavalry in any meaningful sense. Cavalry was found to be especially useful in performing reconnaissance over ground that could not be easily traversed by vehicles, such as dense woodland. In fact, cavalry endured in the Soviet armed forces until as late as 1955, although by the end of World War II such formations were undeniably obsolete.

Soviet cavalry divisions and regiments, like many other units and formations within Stalin's army, came to rely heavily on the SMG for portable firepower. Following the issue of new TO&E from February 1943, SMGs equipped one of the four rifle platoons in each mounted squadron. Photographs of the cavalry in action often show them with PPSh-41s slung around their necks, ready to swing into action to either side of the horse's neck. The description of the firing process runs thus for the PPSh-41:



A Cossack soldier with his mount, plus a PPSh-41. The Soviet Army manuals on the PPSh-41 gave full instructions for firing from horseback, although the operator would need a horse with steady nerves to withstand the noise and muzzle flash of the weapon. (© Hulton-Deutsch Collection/ CORBIS)

> To fire in place, position the horse one-half turn to the right in relation to the target so that the direction of fire will be over the horse's left shoulder. At the moment of firing, extend the torso slightly forward, gripping the saddle tightly with the knees and spreading the feet slightly. To fire during forward movement, stand slightly in the stirrups, extend the torso forward, and put more weight on the knees. Hold the submachine gun above the horse's head. (Gebhardt 1996: 46)

The manual gives further instruction about adjusting posture and balance to fire in various different directions from horseback.

What is apparent from the PPSh-41 and PPS-43 manuals was the versatility both guns provided to the Red Army. The mass distribution of these weapons to infantry, mountain troops, armoured troops, ski soldiers and other types of unit ensured that all parts of the Soviet armed forces had recourse to heavy personal firepower. The German soldier would have to face that firepower in increasingly heavy volumes as the war progressed.

## COMBAT EXPERIENCE

Stalingrad was a battle unlike almost any other in history. Hitler's spring campaign of 1942, intended to claim the Caucasus oilfields, ultimately devolved into a catastrophic urban battle and the encirclement of the German Sixth Army and elements of Fourth Panzer Army in Stalin's namesake city.

The underlying principles of Germany's military victories in 1939–41 were mobility, firepower and aerial attrition. *Blitzkrieg* – as historians have subsequently labelled German offensive tactics – relied upon fast, deep movements to sever enemy logistics, while artillery and air support provided suppression and attrition. Such tactics worked well when the German Army had space to move around the battlefield, but at Stalingrad that space was sorely lacking. Buttoned up in rubble-choked streets, the Germans largely lost all advantages of movement and tactical orientation, a fact of which the Soviet commander at Stalingrad, Vasily Chuikov, was fully aware. Chuikov's tactics would place the SMG at the heart of the Red Army's battle for Stalingrad. Historian Antony Beevor puts this evolution in its historical context:

> Chuikov soon recognized that the key infantry weapons in Stalingrad would be the sub-machine-gun, the grenade and the sniper's rifle. After the Winter War, following the withering attacks of Finnish ski troops, shooting on the move, the Red Army accepted the idea of sub-machine-gun squads of eight men, designed to be carried into battle if necessary on the back of a T-34. In Stalingrad street-fighting, this size of squad proved ideal for close-quarter fighting. During house- and bunker-clearing, the hand grenade proved essential. Red Army soldiers called it their 'pocket artillery'. (Beevor 1998: 153)

The eight-man squads highlighted here by Beevor had limited battlefield influence if armed with Mosin-Nagant rifles. Equip them with PPSh-41s,

A Soviet soldier stands atop the Presidium of the Supreme Soviet in Tallinn, Estonia. He has the PPSh-41, but it is fitted with the 35-round box magazine, rather than the 71-round drum. (Cody Images)

or later PPS-43s, and together they were capable of truly saturating fire at ranges of 200m. The hand grenade, meanwhile, gave them the means to clear enemy positions, before entering them with SMGs racing through the magazines.

There were several ingredients to the lessons the Soviets learned in the 'Stalingrad Academy of street fighting', as it came to be known. One of the first was that it paid dividends to 'hug' the enemy, i.e. keep within about 50m of German troops. The most important effect of this positioning was that it placed German units in as much danger from their own artillery and air power as their opponents; in a 'danger close' position (to use modern terminology), the Germans could not automatically draw on heavy fire for their defence. By contrast, at these ranges the Soviets' SMGs were in their element, providing devastating suppressive fire for both attack and defence. Furthermore, the close proximity of the two sides meant that the Germans lost their sense of spatial and tactical orientation. Instead of an enemy being found 'over there', the enemy was wrapped all around, and in such a situation only attrition counted, not unit manoeuvres.

The key goal for the Soviets was to keep the Germans unbalanced and stressed at all times. In addition to the harrying fire of SMGs and light machine guns, Soviet snipers added their own contribution to the battle, the German soldier never quite knowing from which direction death would come. Many of the Soviet attacks were launched at night, robbing already exhausted and half-starved men of the opportunities for restorative sleep. Even if the attacks were launched, the repeated firing of flares into the night sky kept the German soldier's nerves on edge. Beevor notes that such was the terror inflicted by the Soviet tactics, that the Germans expended more than 25 million rounds of ammunition during September 1942 alone.

For offensive operations, the Red Army at Stalingrad came to rely heavily upon the 'storm group', small groups of men who were adept at performing fast-moving assaults into enemy positions, often at night. The storm groups themselves consisted of three types of group, the assault group, reinforcement group and reserve group. The former totalled six–eight men. For these soldiers, the choice of armament was critical. The fast-firing PPSh-41 was perfect, ideally with the drum magazine to limit the time spent reloading during close-quarters combat. In addition, each soldier would carry between five and 12 grenades, plus a barbaric assortment of knives and sharpened spades, for when close-quarters combat became hand-to-hand fighting.

Backing up the assault group, the reinforcement group, as its name implied, was tasked with consolidating the enemy positions once the assault group had penetrated inside. The position – typically a building –

Following the liberation of Sevastopol in 1944, Soviet troops fire off salutes from their SMGs. Given the amount of lead these guns could put into the air, one hopes that all the bullets would eventually drop in open water. (Cody Images)

was occupied, defensive weaponry such as machine guns, mortars and anti-tank rifles was positioned intelligently around the structure, and food was brought forward to keep the soldiers energized. Over the rest of the day, and subsequent days, the position was reinforced and outlying defensive works were established in the surrounding rubble. The ultimate result was a strongpoint with all-round defence, and hundreds of these were established in front of and behind German lines in Stalingrad. These strongpoints bristled with automatic weapons at every corner and aperture, making any approach a risky business. Even those strongpoints completely surrounded by German troops often managed to hold on for weeks, not least because any German attack against the position had to push through hails of submachine-gun fire from every aspect, merging into a lethal cross-fire. The Soviets also seemed to possess a real gift for barricade and camouflage, meaning that if a German attack actually

**Stalingrad, 1942 (overleaf)**

Deep in the winter of 1942, a Soviet infantry squad engage German troops in the twisted ruins of Stalingrad. Here we see the broad spectrum of Red Army small-arms firepower. The soldier on the left has the standard 7.62×54mmR Mosin-Nagant 91/30 rifle, a bolt-action rifle feeding from a five-round non-detachable magazine. A soldier thus armed would be lucky to deliver 15 aimed shots a minute, but his comrade to the right, equipped with the DP machine gun, could deliver a practical rate of fire of 150rds/min (the DP's cyclical rate was *c.* 550rds/min). The DP, recognizable by its 47-round pan magazine, was the primary squad support weapon, firing the same cartridge as the Mosin-Nagant. For short-range firepower, however, the two PPSh-41s seen here would be unrivalled. Together these two men could put dozens of rounds on target every few seconds; both use the 71-round drum magazine (the man on the right is in the process of reloading), for maximum ammunition capacity. In theatres such as Stalingrad, the PPSh-41 often gave Soviet infantry a crucial firepower advantage over German squads.

### Fighting to Reduce Strongholds

For fighting inside villages and towns the Russians rely principally on infantrymen armed with SMGs, hand grenades, and bottles containing an incendiary mixture. Although the importance of training all infantry units in the art of street fighting is continually stressed, it is considered advisable to train and equip special detachments of assault troops for this task. It is not known how these groups are organized and whether each infantry battalion, regiment, or division has such detachments. It is known that each detachment is subdivided into a reconnaissance force and a main body. The reconnaissance detachment ascertains the best lines of approach and the cover which will enable the assaulting forces to approach their objective. The main body specializes in assault tactics and in hand-to-hand fighting.

The assault troops are taught to avoid advancing along streets or across squares. They must find their way to their objective by using back yards, fences, and lanes, and even by making their way from house to house, breaking through walls or moving from roof to roof if necessary.

The objective of an assault group should be to isolate and reduce a group of fortified buildings which compose a stronghold, and then go on to the next objective if necessary.

The importance of effective artillery support is stressed, but the difficulty of providing it is fully realized. The following procedure is recommended. Before the attack the infantry and artillery commander agree on a preliminary, definite, and simple plan of artillery support and establish a number of Very light signals, preferably, to indicate the progress of the attack.

On the other hand, it is the duty of artillery and mortar commanders to keep in the closest possible touch with the assaulting troops and to use their initiative in giving them close support wherever circumstances permit. A proportion of guns is actually moved forward to take on targets over open sights and to take part in street fighting. (US War Department 1943b)

reached a strongpoint building, they might suddenly discover hidden barriers to entry, often covered by a submachine-gunner or a light machine gun. Artillery observers would control indirect fire from the eastern shore of the Volga, guiding the shelling onto German lines of reinforcement and logistics further away from the strongpoint.

The final ingredient of the storm group was the reserve group. As the name implies, this group was held back in case new assault groups needed to be created, and were also applied to counter any German attempts at flanking manoeuvres.

In addition to Red Army strongpoints, the battle of Stalingrad brought several other tactical innovations. To cope with the frequent German attacks, the Soviet troops used physical obstructions to channel the enemy into kill zones, or to break up the coherence of an assault. Liberal sprinklings of mines and emplaced anti-tank guns provided the explosive means of dealing with Panzers, and mortar shells dropped behind the Panzers served to separate the infantry from the armour – the tanks were left terribly vulnerable to anti-armour squads once they found themselves grinding through the narrow streets on their own.

We must resist gaining the impression that the battle between the Germans and the Soviets in Stalingrad was purely one-sided. The Germans, forced to adapt to circumstances, also created small-unit assault teams equipped with SMGs, grenades and various other hand-held weapons. The Russians also had a bewildering tendency – largely attributed to a

In this photograph, simultaneously quaint and unnerving, a boy soldier holds a PPS SMG, with stock folded. (© Yevgeny Khaldei/ Agentur Voller Ernst/dpa/Corbis)

centralized and rudimentary system of command-and-control – of repeating an attack in exactly the same manner as conducted previously. Such repetition allowed the Germans to position their weaponry in preparation, and inflict an appalling toll on the attackers.

Yet even without considering the Soviet masterpiece of encirclement that eventually consigned Friedrich von Paulus' Sixth Army to the grave, it seems undeniable that the Soviets fought the type of battle they wanted. The SMG was the perfect tool for the high-stress, close-proximity fighting at which certain men excelled, as one Soviet general explained:

> But during the first stage [of the battle] our losses were, of course, very heavy indeed. And yet, the people who survived acquired a tremendous experience in the technique of house-to-house fighting. Two or three men of such experience could be worth a whole platoon. They knew every drain pipe, every manhole, every shell-hole and crater in and around their particular building, they knew every brick that could serve as shelter. Among piles of rubble, which no tank could penetrate, a man would sit there, inside his manhole or crater, or hole in the floor, and, looking through his simple periscope, he would turn on his tommy-gun the moment he saw any German within firing distance. Seldom anything short of a direct hit could knock him out; he was very hard to pick out of his hole and bombing, as I said before, only tended to create new shelters. (Werth 1946, quoted in Flower & Reeves 1997: 475)

Although the Red Army was well served for home-grown SMGs, this didn't necessarily stop its soldiers acquiring enemy weapons. Here the soldier in the foreground has an MP 40, while his comrade uses the PPSh-41. (Cody Images)

It was individuals such as these who proved so problematic for the Germans at Stalingrad. A couple of points, explicit and implicit, emerge from the account. First, the SMG was portable enough for the soldier to hold and use in a confined space, and hence was well suited for handling in the tortured urban landscape of Stalingrad. German firepower was often weighted towards machine guns such as the MG 34 and MG 42. These were undoubtedly excellent weapons in themselves, but fully fledged machine guns need to be emplaced so their muzzles can swing freely over a wide arc, and so they would have been far more visible in the rubble and would attract the attention of snipers and submachine-gunners. Second, the reference to the trench periscope is interesting. Trench periscopes such as the Model 40 were basically optical tubes with an eyepiece at the bottom end and a viewing lens at the top; they were about 56cm long, the half-metre length giving the soldier enough clearance to remain safely down behind cover while viewing the situation in front. Trench periscopes were not standard-issue for front-line Soviet infantry. Instead, they were typically given to forward artillery observers and sniper teams. Here, however, we see a periscope used as a device to assist with launching a one-man ambush, the soldier spotting the target, taking it out with a burst from the SMG, then doubtless popping back down into cover or, more likely, redeploying to another position. By virtue of the 'hugging' tactic utilized by Soviet forces, the distinction between rifle-armed sniper and submachine-gun armed infantryman could break down in practice.

One further point of note is that the Russian SMGs kept working even in the appalling conditions of Stalingrad. If one were to design a field laboratory to test small arms to destruction, it would probably look like the city of Stalingrad in 1942/43. Not only was the air frequently filled with a choking fine dust from the destruction of masonry – perfect for penetrating firearm actions and grinding them to a halt – the winter of that year brought typical sub-zero temperatures. As the Germans found (see below), the environment had a pernicious effect on firearms operation, bringing many automatic weapons to a standstill. The sheer simplicity of

design in the PPSh-41 and PPS weapons, when combined with sound policies on lubrication, meant that these guns would generally keep working regardless of what the war and the weather threw at them.

Stalingrad provided a useful test case for the qualities of the Soviet SMGs, but of course they proved their worth through and across the war on the Eastern Front. Historian Henry Sakaida, in his notable book on the *Heroines of the Soviet Union 1941–45*, here gives one story of a female submachine-gunner who fully embraced the power of her PPSh-41 around Sevastopol in 1942:

> On June 6, 1942, Sgt [Mariya] Baida outdid all her other previous achievements. She crept up to an enemy position and then burst forward with her submachine gun, killing 15 German soldiers and their officer. She knocked out several more with the butt of her PPSh-41. In the process, she rescued her commanding officer and eight comrades who were prisoners, and captured a machine gun and other weapons. (Sakaida 2003: 21)

To accomplish this feat, it is likely that Baida had the 71-round drum fitted to her PPSh-41, to give her the necessary sustained and responsive firepower to kill no fewer than 16 German troops in a single action. Just for good measure, she then demonstrated the rigid construction of the weapon by knocking out several men with the stock.

In balance to the above, note the following story, told by the former commander of a Soviet penal company:

> The entire German column ended up blocked on the narrow highway, surrounded by deep and soft snow. The Germans jumped out of the trucks, under heavy fire, and fled in all directions, in panic. Some of them lost their senses, and ran straight towards us, towards the hail of lead from the machine-guns and submachine-guns of our men ... I could not bring down one of them by firing my submachine-gun. He was running skilfully from one tree to another, hiding behind them, while I was so excited about the hunt that I fired my submachine-gun without aiming. Then I pulled my Nagant revolver out of its holster, took careful aim, and killed him with my very first shot, at about a hundred metres distance. My faith in the effectiveness of my faithful revolver not only in close range combat, but also at long distances, was confirmed. (Pyl'cyn 2006: 34)

The outcome of this story – the soldier's resort to his trusty Nagant revolver – should not distract us from the sheer chaos visited upon the German column by the arcs of submachine-gun lead splitting the air. The claim that this soldier downed an evasive target at 100m distance takes some believing. This story does highlight, however, one important point about the use of the SMG. Popular impressions of SMGs often suggest that it is virtually impossible to miss the target when firing one. In fact, SMGs do require reasonable control if they are to be used accurately. A poor grip and ill-considered burst can cause the muzzle to run away

from the target, bucking off the point of aim with the ripple of recoil. Short bursts are typically advised, delivered from the shoulder not the hip, the gunner adjusting the point of aim after each burst. Sometimes, as with the case of this soldier here, a single precision shot can achieve what a multitude of lead has failed to do.

## FIRE CONTROL

Although the SMG gave the individual Soviet soldier the means to deliver powerful firepower on a personal level, such fire also had to be controlled across the unit by officers and NCOs. In a mass conscript army, and in the context of a major engagement, having dozens of soldiers all spraying away at targets of choice could create problems all of their own. Fire can be scattered and ineffective if everyone is left to his own devices without clear leadership, or the soldiers might not even fire their weapons at all, should they give in to paralyzing fear. In the PPSh-41 manual's section on fire control, therefore, one can clearly see the centralized mindset of the Soviet Army, plus the need to give prescriptive instruction to a force with frequently erratic standards of training. For example, the chapter entitled 'Methods of Firing with the Submachine Gun' begins with an explanation of the basic sequence of firing: preparation (essentially making sure the weapon is ready and that the soldier is in a tactically judicious position), firing the shot and the ceasefire procedure (including replacing the magazine). While the manual goes on to point out that the 'submachine gunner fires upon command of his commander or at will' (Gebhardt 1996: 37), it then explains in detail the typical fire mission given by a field commander:

> This mission or command specifies the target, the sight, the point of aim (if required), and type of fire.
>
> In order to commence semi-automatic fire, the commander can give one of the following type commands: 'Marker 2 – rock pile, in 50 [metres] – dugout, at the soldiers, 10 [sight setting], single shot – fire.'
>
> 'Straight ahead in the field – dugout, in the left corner – periscope, at the periscope, 20, single-shot, 2 rounds – fire.'
>
> In order to commence full-automatic fire, the commander can give one of the following type commands: 'Marker 3 – dead tree, right two fingers in bushes – machine gun, at the machine gun, 20, two short [bursts] – fire.'
>
> 'Straight ahead, at the running figure, 20, in the chest, short – fire.'
>
> 'At the attackers, long – fire.' (Gebhardt 1996: 37)

Similar instructions are still given by military leaders today, the command including everything a soldier needs to know for his personal fire mission: target name; description of target for identification; sight setting; type of fire; duration of fire; command to fire. Giving these instructions precisely and effectively meant that, in an eight-man squad, an awful lot of rounds would be ripping into a defined target in a concentrated period of time.

Prior to being issued, and periodically during field service, the weapon's zero had to be adjusted so that the rounds were falling correctly in relation to the sight. This procedure was performed by a master armourer, not the soldier himself, as it involved adjusting the position of the front sight. The typical test for a weapon's zero was to place the SMG on a stable rest, firing at a target 50m in front with the rear aperture sight setting on '20'. The target itself was a black rectangle 30×20cm, fastened on a white background and with a white spot painted into the rectangle 22cm above the central, bottom edge of the shape (this was the aiming point for the shooter). Four single-shot rounds were fired, and the target thereafter inspected: 'The submachine gun's zero is considered normal if at least three of the four bullets are contained in a circle of 15 cm in diameter, when the center of the circle coincides with the mean point of impact, and if the mean point of impact does not deviate from the registration point in any direction' (Gebhardt 1996: 32).

The business end of the PPSh-41. This view shows just how much the 71-round drum magazine projected either side of the weapon. The overall weight of the gun changed by nearly 2kg as the rounds in the magazine were fired to empty. (Gunpics)

In practical shooting, shot dispersion is caused by a multitude of factors, from the way that the soldier handles the gun through to environmental effects. In terms of full-auto fire, considerations such as temperature and crosswind were actually moot; the shot dispersion generated by firing on full-auto would on its own exceed the dispersion produced by the weather. In such cases, the soldier would therefore follow a 'burst–observe' approach to adjust the fall of his bullets onto the target. If the soldier was being a little more careful with both his ammunition and his aim, however, semi-auto fire had to be delivered with a studied eye towards environmental influences. Detailed tables are provided in both the PPS-43 and the PPSh-41 manuals for understanding the adjustment of fire. In general outline, however, the point of aim (POA) – which as a benchmark is described as the 'middle bottom edge of the target' – is lowered when the shooter is dealing with a strong tailwind, and raised in the case of a headwind. For example, compensating for a strong tailwind when firing at a target 150m away involves lowering the POA by 1cm, while shooting into a strong headwind at 250m requires raising the POA 6cm. (Note that in these cases a 'strong' wind is defined as that blowing at more than 10m/sec.)

Crosswinds present a different challenge to the shooter, in that he has to apply deflection to his shot to allow for the wind pushing the bullet from the POA onto the target. We must always remember that even though the Soviet SMGs could be devastating weapons at short range, they still fired pistol rounds. Even high-powered rifle rounds flying with a muzzle velocity of 1,000m/sec are affected significantly by crosswinds over long ranges, so the

The PPSh-41 was to be found in a wide variety of hands during World War II. Here we see freedom fighters open up with a mix of PPSh-41s and German Kar 98k rifles, during the Slovak national uprising in 1944. (Cody Images)

light, low-velocity pistol rounds were even more prone to being blown off course. The necessary allowance in POA was often explained in terms of adjusting by the width of the human target form, this being a more understandable and applicable rule than quantifying everything precisely in centimetres. For example, a soldier engaging a human target at 100m, but with a 90-degree crosswind blowing in from the left, would have to shoot a half-body width (the width of the perceived target, that is) to the left. Scale the distance up to 300m, and the deflection could be as much as three body widths.

Similarly, the POA required adjustment according to air temperature, of which the Soviet Union experienced seasonal extremes. Put simply, warm air offers reduced frictional resistance to a bullet in flight, being less dense than cold air, hence the bullet flies with a flatter trajectory. The colder the air, the more resistance and the sooner the bullet heads for earth. The changes in temperature also affect the burn rate of nitro-cellulose propellants – the colder it gets, the slower the propellant burns – hence the POA in the depths of a northern Russian winter could be very different from that of a bullet leaving the muzzle in the middle of a blazing summer's day in southern Ukraine. Again, the manuals provide tabular instruction on the correct adjustments to make. At +35 degrees Celsius and firing at targets 250m away, the aim point might be lowered by 16cm, whereas at -35 degrees Celsius, the POA might be raised by 32cm.

Naturally, the common Soviet soldier during World War II would often have little time or education to absorb such points in fine detail. The finer principles of POA adjustment would often be summed up in simple verbal rules, and the details were then ingrained in muscle and mind by frequent firing and the observation of the bullet impacts. Snap-shooting was taught during basic training with the SMG. To perform this correctly, the shooter first had to 'observe the battlefield intently' (Gebhardt 1997: 43) to define the targets and assess the landscape through which they were moving. He then had to mount his gun quickly, aiming either at the spot he expected the target to appear (if, say, the target was flitting through trees) or giving

the appropriate amount of lead in front of a running figure. If, for example, the enemy soldier was running at 90 degrees across the face of the shooter, then at 100m the shooter would have to aim 2–2.5 human body widths in front of the target at the moment of pulling the trigger. More experienced instructors would tell the trainees to keep the gun moving as they pulled the trigger; if they stopped the gun movement at the point of firing, they were likely to miss behind the target. That said, the simplest way to teach men quickly was to get them to fire ahead of the target, then walk the bullets backwards towards the running man, who effectively moved into the bullet stream. This worked well with SMGs at slightly longer ranges.

The submachine-gunner would also have to get a firm grip on fire control if he wasn't to burn through his available ammunition at an unsustainable rate. To some extent, the rate of fire was dictated by the type and distance of the target that presented itself. Engaging multiple enemy grouped closely together, but clearly visible as individuals, suited bursts of full-auto fire or carefully placed semi-auto fire, the recommendation being the soldier fire short bursts switching frequently between the members of the opposing force. (Firing at the group as an entity might seem the most efficient fire plan, but actually aiming at everything can translate as aiming at nothing, resulting in a surprising amount of misses for heavy fire.) Should the enemy force present itself in a dense undifferentiated line or bloc, then long bursts of full-auto fire were appropriate to deliver the maximum damage in the shortest space of time. The advice was to switch from one flank of the target to the other, thus preventing enemy soldiers moving quickly outwards to try to outflank the submachine-gunner. Alternatively, if the target was a physical position, or the enemy soldiers were operating in camouflaged positions, the submachine-gunner could rely on long bursts over the target area, utilizing the principles of what US forces would later call 'reconnaissance by fire'.

## CARTRIDGE PERFORMANCE

To gain the full impression of the capabilities of the Soviet SMGs, some consideration of the cartridge fired is warranted. A quick scan through firearms forums shows a mixed response to the 7.62×25mm Tokarev cartridge, with the debate centring around the contention that it is a good round for accuracy and penetration but, ironically, a poor round for self-defence. Given that the PPSh-41 and PPS-42/43 accounted for thousands of Axis soldiers during World War II, these opinions obviously need a little unpacking.

If we glance through the table of comparative data on Allied and Axis pistol cartridges, presented here, one fact about the 7.62×25mm Tokarev cartridge jumps out immediately. In almost all cases, the muzzle velocity of the other cartridges is well below that of the Soviet cartridge, in some cases by more than 50 per cent. (The exception is the German 7.62mm Mauser, but in essence the 7.62×25mm Tokarev is actually a Soviet version of this round.) Higher muzzle velocity translates to a flatter bullet trajectory compared to those with a lesser velocity.

**Comparative data on Allied and Axis pistol cartridges**

| Cartridge | Round length | Case length | Bullet weight | Typical muzzle velocity |
|---|---|---|---|---|
| 7mm Nambu | 26.92mm | 19.81mm | 3.56g (55gr) | 320m/sec |
| 7.62×25mm Tokarev | 34.55mm | 25.14mm | 5.57g (86gr) | 455m/sec |
| 7.63mm Mauser | 34.55mm | 25.14mm | 5.57g (86gr) | 455m/sec |
| 8mm French Mle 92 | 36.70mm | 27.30mm | 7.75g (120gr) | 265m/sec |
| 9mm Glisenti | 26.21mm | 19.05mm | 7.97g (123gr) | 320m/sec |
| 9mm Parabellum | 29.28mm | 19.35mm | 7.45g (115gr) | 396m/sec |
| 9mm Browning Short | 24.98mm | 17.27mm | 6.15g (95gr) | 270m/sec |
| .380 Revolver Mk 1 | 31.62mm | 19.38mm | 12.96g (200gr) | 168m/sec |
| .38in Special | 38.86mm | 29.46mm | 10.23g (158gr) | 260m/sec |
| .45 Auto Colt Pistol | 32.19mm | 22.79mm | 15.16g (234gr) | 250m/sec |
| .455 Webley Revolver | 31.24mm | 19.05mm | 15.23g (235gr) | 176m/sec |

Comparison between the 7.62×25mm and the .45 ACP is illuminating in this regard, for both cartridges are regarded as the 'big hitters' of the pistol cartridge world. Fired in comparative tests, the 7.62mm round demonstrates a far superior trajectory, dropping about 18cm in 180m whereas the .45 drops roughly the same amount in just half that distance. This is a key reason why both the PPS-43 and PPSh-41 manuals include range data out to 300m – for most pistol cartridges, commanding this sort of range would be an utter impracticality, but for the 7.62×25mm it is a realizable possibility (although 200m is a more realistic practical range). It is often noted that the performance characteristics of the 7.62mm Soviet round actually approached those of rifle cartridges. The downside is big muzzle flash and a hefty kick, but if these can be controlled then the submachine-gunner has a round that can 'reach out and touch' the enemy at ranges beyond those of similarly armed opponents. For reference, bullet drop for the ubiquitous 9mm Parabellum is more than 25cm at 100m.

So, the first victory goes to the 7.62×25mm cartridge. Why is it, therefore, that many people claim the 7.62mm round to be a poor cartridge for self-defence? Here we move into the complicated world of terminal ballistics, which we shall simplify greatly to make the key points.

The 7.62×25mm pistol round, as used in the Soviet SMGs. Fired from these weapons, the bullet generated a muzzle velocity of around 450m/sec. (Malis)

When a bullet is fired, the amount of energy required to accelerate it to a given speed is known as the bullet's kinetic energy. When the bullet finally hits a target, the kinetic energy is transferred into the target as it attempts to stop the bullet. The crucial point, however, is that if the bullet stops inside the target before exiting, all of the bullet's kinetic energy is transferred into the target, causing greater internal damage as long as it penetrates far enough to strike internal organs. If a bullet punches straight through the target, even though it delivers a long 'permanent cavity' inside the body, some of the bullet's kinetic energy is expended on continuing the flight beyond the target, rather than dumping it all within the unfortunate individual.

Here is the hub of the debate about the 7.62×25mm's suitability as a self-defence round. The slow, fat, .45 ACP tends to stop dead inside the target, giving it a deserved reputation as a thumping manstopper, whereas the fast-moving 7.62×25mm round has exceptional penetration, and thus can 'overpenetrate' the target. The penetration of the cartridge is by no means a myth. A photo displayed on a firearms forum shows a piece of metal tubing shot, side by side, with a 9mm Parabellum and a 7.62×25mm Tokarev. The 9mm impact is evident as a deep indentation, but the 7.62mm round has gone straight through the metal, leaving a ripped-edge hole. It has been noted – with concern in many places – that at close ranges the 7.62mm bullet can punch through Class I, IIA and II ballistic vests, and even work its way through ballistic nylon and kevlar helmets. Indeed, in 2010 the composite fibres manufacturer DSM Dyneema unveiled a new type of high-performance body armour aimed largely at combating the threat of the 7.62×25mm cartridge, still used in large quantities throughout former communist states. In combat testimony, some Soviet soldiers have recounted that hitting an enemy soldier with a burst from an SMG often resulted in the bullets rippling out the enemy's back, with gory effect.

So, it might well appear that the 7.62×25mm Tokarev is guilty of the charge of overpenetration. Yet I would suggest that the Tokarev round was, and is, actually an excellent cartridge for military, as opposed to civilian, use. In the civilian world of law enforcement, combat ranges are typically the distance across a room or street, hence long-range reach is not important. Furthermore, overpenetration at these ranges could have serious legal consequences, not least through the risk of bullet overflight resulting in dead or wounded bystanders.

If we wind back the clock to the conditions on the Eastern Front in 1941–45, by contrast, the 7.62×25mm Tokarev appears in a different light. For a start, the cartridge had the capability of commanding combat ranges of between a few metres and 200m+; it is worth noting that both Allied and Axis studies of practical combat ranges came to the conclusion that most small-arms exchanges took place below 400m, as beyond that it was difficult enough for the regular soldier (without specialized optics) actually to see his enemy, let alone shoot him. Although the Soviet SMGs couldn't reach out to 400m, the fact that they could deliver automatic fire out to 300m meant that even when faced with rifle-armed opponents their operators could still trade blows at most practical ranges.

The overpenetration accusation is also undermined when looking at the practical realities of warfare. Penetration data often comes from either studies of the impact of bullets on unprotected human bodies, or tests conducted with a substitute medium, primarily ballistic gelatine. Yet soldiers on the battlefield, even those not wearing body armour, have their bodies wrapped in all sorts of uniform and equipment. A German soldier on the Eastern Front could have belt kit, ammunition pouches, *Zeltbahn* sheet, personal items, bayonet, gasmask case, padded jackets (in later winters) and steel helmet distributed around his person, and many of these items would have been capable of stopping a bullet or diminishing its power. The 7.62×25mm cartridge delivered a punch that could smash through such equipment to reach the vulnerable flesh beyond. Furthermore, a stream of Soviet submachine-gun bullets had a good chance of working their way through light–medium cover, such as logs or soil barriers. What must also be considered is that while many bullets are indeed capable of going straight through a human body, they often do not do so in reality. Once a bullet enters a medium thicker than air, it becomes unstable, frequently tumbling or fragmenting, especially if it strikes a bone on its passage. The effect is to create explosive, ragged injuries, with devastating blood loss to the victim. If we imagine the effects of being hit by a five-round burst of 7.62×25mm cartridges, then it is easy to see how the victim's chances of survival were poor.

Note that the 7.62×25mm Tokarev was not only available in a standard jacketed ball round. In 1941, specifically for the PPSh-41, the P-41 bullet was introduced. This was a combined armour-piercing/incendiary round, with a hardened steel core designed to work through more resistant targets and engage light vehicles and even aircraft. The latter was not treated as an outlandish possibility, given that the SMGs were capable of hitting German aircraft making low-level strafing and bombing runs. A whole section of the submachine-gun manuals is devoted to the practicalities of engaging aircraft, and provides a table of lead distances for shooting at aircraft travelling at speeds of 100 to 235 knots (51–120m/sec). The section also explains how the submachine-gunner should fire at descending parachutists, i.e. allowing for a certain number of body lengths below the figure to secure a hit.

A pile of 7.62×25mm Tokarev cartridges. This cartridge was essentially a Soviet version of the German 7.63mm Mauser cartridge, and it contrasted with the 9mm cartridge by being of a bottle-necked design. (Gunpics)

As a conclusion to the debate over the merits of the 7.62×25mm Tokarev, we can argue that the real strength of the cartridge was its *versatility*. The Soviet Army during World War II needed a weapon that could tip the balance of firepower in its favour in the thousands of small-

The spare 71-round drum magazine for the PPSh-41 was carried in a canvas pouch worn on the soldier's belt. Combined with the magazine in the gun, the soldier had 142 rounds at his disposal with only one magazine change. (Gunpics)

scale battles that took place across the Eastern Front. The 7.62×25mm cartridge, allied with the PPSh-41 and PPS-42/43, offered such a platform.

Before moving away from the topic of ammunition, one point that remains to be explained is how the Soviet soldier carried the ammunition for his SMG. Given that both the PPSh-41 and the PPS SMGs could be greedy of ammunition, the Soviet soldier would try to have as many rounds as possible about his person. Alexander V. Pyl'cyn, whose handiness with a Nagant revolver we observed above, explained how the ammunition was distributed:

> Finally, our turn came to join Operation Bagration which was already in full swing. We were well stocked with ammo during the two weeks prior to the offensive. We received 200–250 cartridges for each PPSh submachine-gun. The cartridges were packed in 'zincs' as we called the boxes of thin zinc covered iron, and their impregnated carton packages. Many submachine-guns had two round ammo drums, each one for 71 cartridges. (Pyl'cyn 2006: 55)

In action, the PPSh-41-armed Soviet soldier would typically have one 71-round drum fitted to the weapon, and another carried in a leather and canvas pouch attached to the belt. As the war progressed, and the curved 35-round magazines became more common with the production of the PPS-43, a three-magazine pouch was issued, again worn on the belt. Thus in total the average Soviet submachine-gunner would have roughly 150 rounds in a magazine-ready state, plus he would carry extra boxed ammunition in his pack. In rapid-fire combat situations, such as those experienced in Stalingrad, the soldier would attempt to carry as many spare magazines as possible, in extra pouches and packs. The simple loading and firing procedure of both the PPSh-41 and PPS-43 meant that a magazine change could be performed in a matter of seconds, with only a brief pause in shooting.

## COMPARATIVE ARMS

A full assessment of the wartime Soviet SMGs profits from a comparison with the competing arms available to the enemy, and also to the Soviets themselves. For the PPD, PPSh-41 and PPS were not the only SMGs available to the Red Army during the war. The largesse of the US Lend-Lease programme also brought with it 137,729 .45-cal Thompson SMGs. These came mainly in two types: the M1928A1 and M1 variants. The M1928A1 was mechanically a quite different animal from the PPSh-41. It used a complicated delayed-blowback system known as the Blish system, in which the opening of the breech after firing was delayed by two blocks of metal pressing obliquely against one another. As the pressure dropped following cartridge ignition, the blocks eventually began to move and allowed the gun to cycle through recoil and reloading.

If this system sounded complicated compared to the rudimentary blowback system of the PPSh-41 or PPS, that's because it was. In fact, under the environmental conditions of the Russian Front, the Thompson M1928A1 didn't perform well. The breech would sometimes lock up during the winter months, and the extraction systems were unreliable. Nevertheless, the Thompson had some advantages. It had a slower cyclical rate of fire (700rds/min), but its .45-cal rounds were (noting the comparison made above) real mankillers at ranges of under 100m. It also came with a useful range of magazine sizes, mainly a 30-round box magazine of 50- or 100-round drum magazines.

The later M1 Thompson, much to the chagrin of the Auto-Ordnance company that produced the Thompson, were designed around straightforward blowback, on the orders of the US Army. This weapon

The Thompson M1928 – here in a disassembled state – was supplied in comparatively small numbers to the Soviet Union via Lend-Lease, but suffered from reliability issues in the Soviet winters. (C. Corleis)

formed the bulk of the Lend-Lease supplies to the Soviets, and it was far more reliable than its predecessor. Those who acquired such a weapon doubtless gained good service from it, but the lack of availability of .45 ACP ammunition amongst such a huge army meant that the Thompsons were a drop in the ocean when considering the millions of Soviet SMGs manufactured in such a short space of time.

Looking now at the Germans, their SMG use on the Eastern Front is interesting because, on occasions, it reflects a direct response to the threat of the PPSh-41 and PPS SMGs (particularly the former). The two main German SMGs were the MP 38 and the MP 40. The forerunner, the MP 38, was designed by Heinrich Vollmer of Erma Werke (not Hugo Schmeisser, as is popularly credited), in the late 1930s, and it broke new ground in the field of infantry small-arms design. It featured no wooden furniture, and had a folding metal stock. It fired the 9mm Parabellum cartridge, 32 of which were held in a single-stack magazine, and had a generally reliable blowback mechanism firing at a full-auto rate of 500rds/min. Its main problem was that it remained relatively expensive to manufacture in an era of total war, relying heavily on machining processes. A rationalization of the weapon began, resulting in the MP 40, which in many ways was the same gun but simplified for the needs of mass production.

The MP 40 was undeniably an excellent firearm, if well maintained and when operating within its optimal climatic conditions – i.e. those of Western Europe. However, the Eastern Front in winter revealed the flaws of all but the most rugged weapons, and the climate was particularly hard on the MP 38 and the MP 40. Dirt and ice frequently worked their way into the bolt mechanisms, causing the guns to jam tight at critical moments of a firefight. Unsuitable lubricants led to further stoppages. Both guns also suffered a deficiency in the design of the single-stack magazine. This long magazine not only gave problems when firing from a prone position, but it was also susceptible to damage and misfeeds.

All this being said, there are still photographs from the Eastern Front showing Soviet soldiers proudly clutching captured MP 40s. We should not, however, read too much into this fact. Soldiers have always had a fondness for acquiring the weapons of their opponents, and sometimes of mythologizing their performance. In addition, the majority of Red Army troops were equipped with bolt-action rifles, so it may well have been preferable to acquire a German SMG as a more suitable weapon for the combat conditions. Certainly, there were those who took up an MP 40. During the battle for Berlin in April 1945, Soviet soldier Lieutenant Evgeni Bessonov rode into action on a tank in the southern parts of the city, clutching a German SMG:

> At dawn on 22 April we approached a high railway embankment and were stopped by intensive fire. We could have destroyed the German delaying force and moved on forward, but the problem was that the passage under the railway bridge was filled with sand and fortified with big logs, connected with metal girders. We did not manage to destroy that barricade … We rode on tanks for some time and all of a sudden came under fire from trenches on the right-hand side of

> the road. The tanks stopped, I ordered, 'Dismount! Fire!' and the whole company ran towards those trenches firing non-stop from our submachine guns. Right in front of me was a Fritz in a trench. I tried to cut him down with my German submachine gun, but apparently during the skirmish at the embankment some sand had got into the bolt. I jerked the bolt, pulled the trigger, but it did not fire. The German did not think long, grabbed his rifle and aimed at me … Right at that time a submachine gun burst sounded in the air and the German dropped dead at the bottom of the trench. It turned out that it was Drozd who cut him down with a Soviet PPsh submachine gun, which never jammed in battle. Why the hell did I carry that submachine gun? We jumped across the trenches, some Germans fled, while the rest were killed. Andrey took away my submachine gun, took out the magazine and threw the submachine gun away. (Quoted in Bull 2012)

The account here presents a stark contrast between the MP 40 and the gun 'which never jammed in battle'. The Germans also noted that the PPSh-41's custom-designed reliability for Russian conditions was in contrast to many of their own small arms, so consequently both the PPSh-41 and the PPS weapons became prized possessions of thousands of

Even the members of the Waffen-SS were not averse to using the Soviet PPSh-41. Here a soldier clutches a PPSh-41, which gave superior firepower when compared to the German equivalent, the MP 40. (Cody Images)

While his comrade struggles with the magazine of an MG 34 machine gun, mounted atop an armoured vehicle, a German Waffen-SS soldier provides covering fire with a PPSh-41. (Cody Images)

German troops. Ammunition supply problems weren't as much of a problem as expected. Not only were millions of rounds of Soviet ammunition captured during the course of the war, but the Germans also found that they could use home-grown 7.63mm Mauser ammunition in the guns. The German soldiers fortunate to possess a PPSh-41 valued not only its steady reliability, but also its impressive firepower, its range (in relation to the MP 40) and, when available, its 71-round drum magazine.

Such were the numbers of PPSh-41s pressed into service with the Wehrmacht that the weapon even received its own German service title – the MP 717(r). But the German fondness for the PPSh-41 design meant that they went further than just using captured guns. Large numbers of the weapons were actually converted to fire 9mm ammunition. This process involved replacing the barrel and then installing an adapter in the PPSh-41 magazine aperture to take standard 32-round MP 40 magazines. The new weapon, termed the MP 41(r), was an unsatisfactory hybrid. On the one hand, the new weapon combined the legendary dependability of the PPSh-41 with the Germans' preferred submachine-gun calibre, thereby streamlining ammunition logistics. But conversely, the 71-round drum magazine could no longer be used, which was one of the reasons German troops acquired the weapon in the first place. In addition,

the conversion to 9mm meant that the weapon's rate of fire now dropped to 800rds/min, still fast but now under the fire rates of the original weapon. Many German troops simply converted these guns back to their Soviet format in response.

The encounter with the fast-firing and ammunition-heavy PPSh-41 also inspired a German experimental rethink of the MP 40. As an answer to the great magazine capacity of the 71-round drum, German gun designers created a dual-magazine feed system for the MP 40 in 1942. This weapon, known generally as the MP 40/II (although it is termed the MP 40/I in Wehrmacht equipment lists), featured a pair of standard 32-round magazines set side by side in a sliding housing. One magazine would be emptied by firing, then the user would press a latch on the front of the magazine housing and slide the pair of magazines across, aligning the full magazine with the chamber. Then the user would pull back the bolt of the gun once again, and the weapon was ready to use.

As with so many of Germany's ingenious but impractical weapon designs, the MP 40/II was an abortive diversion. The resulting gun was enormously heavy – loading with the twin magazines it weighed 5.45kg, and still didn't really offer the reliability/firepower combination of the PPSh-41.

The PPSh-41 and the PPS-43 were two of the greatest SMGs of World War II, if not the greatest. It was inevitable that they would have a long life following the end of the war in 1945, although they would eventually be overshadowed by a new concept in the history of firearms development.

The MP 40 was a fine SMG, although it was not as robust as the PPSh-41 or PPS, nor did its rate of fire (500rds/min) match that of the two Soviet guns. (Quickload)

# IMPACT

## The SMGs and the new world order

Even as the last shots were being fired across Europe in World War II, a new strategic tension was emerging between the communist Soviet Union and the capitalist West. This tension would swell into what we now call the Cold War, more than four decades of threat between bullish superpowers. Yet although we associate the Cold War with nuclear standoff, it was also a period that had a profound impact on the distribution and development of small arms.

For the Soviet Union, the PPSh-41 and PPS-43 would serve on with their armed forces into the 1950s, until they were steadily replaced by the AK-47, about which we shall say more below. But the end of the war brought with it a truly international communism, either enforced (as in much of Eastern Europe) or willingly adopted (e.g. China and South-East Asia), with the Soviet Union and Eastern Bloc's arsenal acting as a great

A militiaman from the National Patriotic Front of Liberia (NPFL) brandishes his PPS-43. He has taped multiple magazines together, to facilitate a very quick magazine change during combat. (© Patrick Robert/Sygma/Corbis)

military supply hub for the numerous proxy and post-colonial conflicts that now flared up around the world. We have already noted above the sheer number of post-war users of Soviet SMGs, and it is worth exploring how these weapons were used in a very different range of conflicts.

## CONVENTIONAL WARS

On 25 June 1950, after a period of increasingly fractious relations in the politically divided Korean peninsula, the communist forces of North Korea invaded US-backed South Korea, triggering a bloody war that would last for three years. This was a true international conflict, sucking in not only the United States and China, but also many European and British Commonwealth countries.

As noted above, the PPSh-41 and the PPS-43 were both used in large numbers by the North Korean People's Army (NKPA) and the People's Liberation Army (PLA) of China, the former mainly using Soviet-supplied weapons while the latter produced their own versions as the Type 50 and Type 54 respectively. The numbers and handling of these weapons amongst the communist troops could be erratic, but there was no doubt that they were a cause of both alarm and casualties amongst the South Korean and United Nations forces. For US infantryman David Mills, a close-up encounter with a Soviet SMG was nearly his last:

> WASHINGTON, July 24, 2012 – When infantryman David Mills joined the Army on his 17th birthday and was sent to fight in the Korean War, his mission was to hold Outpost Harry 'at all costs.'…
>
> But on April 24, Chinese troops nearly took Outpost Harry.
>
> 'We had 88 men holding the outpost,' he said. 'The attack was ferocious. We were overrun. Hand-to-hand fighting occurred in all of the trenches, and very heavy losses were suffered on both sides.'
>
> The forward observer from the 39th Field Artillery called for backup artillery to stop the attack, which was successful, he said.
>
> But things didn't turn out as well that day for Mills, who received nine wounds – two in the head, six in the leg and one in the left arm.
>
> During what Mills described as very close fighting with hand grenades and bayonets, his weapon overheated and became inoperable. While searching for another, he crawled on his stomach to the entrance of a bunker about 30 yards away.
>
> 'Nobody was in there,' he said. 'I reached in to grab a rifle, and I felt something poke me in my back. I backed out very slowly and turned over, and was looking at the muzzle of a Russian-made submachine gun.'
>
> Three Chinese soldiers stood over him, Mills said. One held the gun, and the other two carried six grenades each, three on each side of their chests, he said.
>
> 'I thought I was going to die,' Mills recalled reciting a short prayer as he looked up at the barrel of the weapon. (American Forces Press Service 2012)

A US soldier in the Korean War rests by the side of a captured Chinese bunker (including its Soviet DP machine gun) during the Korean War, 25 April 1951. He is armed with the M2 Carbine, which offered greater accuracy but less firepower than the communist SMGs. (DoD)

Mills went into captivity, a horrific period of deprivation and cruelty, but ultimately survived the war. Nevertheless, he later wondered whether he had been captured with an empty gun, which saved him from being mown down like so many others.

As the Soviet soldier had discovered in World War II, the North Korean and Chinese soldiers found that the SMG was the ideal weapon for the close-quarters fighting that characterized much of the infantry warfare during the Korean War. But we should always remind ourselves that a single weapon alone is rarely capable of winning an entire war. During World War II, it was more the growing Soviet dominance in artillery, armour and later air power, and its vast industrial power and huge manpower resources, that overwhelmed the Axis on the Eastern Front, rather than two specific types of SMG. The Soviets also came to use the SMG with tactical efficiency amongst a veteran army, which often tipped the balance in the thousands of small-scale battles that rippled across the front line. During the Korean War, US and UN veterans came to have a respect for the 'burp gun', as they labelled the enemy's SMGs, but the potency of these weapons was wasted in tactical applications devoid of imagination and humanity. Here ex-US Marine Charles Cooper remembers a mass attack on a US outpost:

> The intense exchange of hand grenades continued as the Chinese tried to batter their way into our position while we did our best to destroy them before they generated any momentum. The numbers of grenade explosions increased steadily, their sounds reaching a lasting fortissimo, a sign that their infantry was following in the assault. Then we heard the staccato sounds of their burp guns, and the deep chugging sound of their heavy machine guns. The burp guns were the mainstay of the North Korean and Chinese armies. Resembling our old Thompson submachine guns, the burp gun had a cyclic rate of fire of 550 rounds per minute. If they had been accurate, or if the soldiers using them had had even average marksmanship training, the Chinese assault would probably have proven too much. But they were poor marksmen and used a large volume of fire to compensate. (Cooper 2006: 53–54)

The last point made here is an important one for our general history of the Soviet SMGs. Volume of fire alone might feel impressive to the side delivering it, but it cannot replace sound tactics or efficient fire control. Even in professional armies, the number of rounds expended for each kill is usually extremely high, numbering in the hundreds if not the thousands or tens of thousands. Weapons like the PPSh-41 and PPS-43 can, by virtue of their destructive power, make an inexperienced soldier feel potent, but thousands of such men were mown down on desolate mountainsides during the battles of the Korean War.

This being said, other US soldiers noted that in patrol and ambush situations, rather than full-scale battles, the firepower of the burp gun could be a decisive factor in the outcome. A US infantry lieutenant observed that 'on full automatic it sprayed a lot of bullets and most of the killing in Korea was done at very close ranges and it was done quickly – a matter of who responded faster. In situations like that it outclassed and outgunned what we had. A close-in patrol fight was over very quickly and usually we lost because of it' (Halberstam 2007: 447). The US soldiers at this time were armed with the M1 Garand rifle and the M1/M2/M3 Carbine. The Garand was a tough old bird, and certainly stood up to the conditions thrown at it by the Korean climate. Yet it only possessed an eight-round feed, and no full-automatic capability. The Carbine offered a greater magazine capacity (15 or 30 rounds), and full-auto fire, but it had its own problems. There were many complaints about its reliability, especially during the winter months when jamming became common. It also seemed to lack penetration (a problem also observed by soldiers using the weapon in the Pacific during

Communist Viet Minh troops take over Haiphong in the 1950s, during the French Indochina War (1945–54). Communist Asian forces relied heavily on either Soviet weapons or Chinese copies; the soldier at the front right of the truck here has a PPSh-41 with box magazine. (Cody Images)

World War II), with some soldiers observing that it struggled to take down opponents clad in thick padded uniforms. The PPSh-41/Type 50, by contrast, offered a high magazine capacity and decent penetration. In balance, we should point out that the M2 Carbine (a selective-fire weapon – the M1 was semi-automatic only) was felt by some to be superior to the PPSh-41, particularly in terms of accurate shooting at ranges of 100–150m. As always, context is important. Firing from a pre-prepared defensive position, the M2 Carbine might be the superior weapon, whereas in a sudden close-quarters ambush, where volume of fire can decide the outcome, the PPSh-41 could hold sway.

The Korean War was, of course, just one of the dozens of theatres in which the PPSh-41 and PPS-43 served following the end of World War II. Examining each conflict in turn would take a larger book than this, but the sheer diversity of the theatres throws up some important general points about the design of the Soviet SMGs.

The first point is that the post-war service of the Soviet weapons meant that the guns were field tested in an even broader range of climates than initially intended. For example, the Chinese Type 50 was supplied in large numbers to the North Vietnamese Army (NVA) and the Viet Cong during the early years of the Vietnam War in the 1960s, many of these weapons being converted into the indigenous K-50M variant. The tropical climate of South-East Asia could be particularly hard on weapons, not least because of the rusting effects induced by very high levels of humidity. The Type 50/K-50M was nevertheless just as dependable when used in smothering jungle heat as it was on the frozen steppes of northern Russia. The high rate of fire offered by the gun was ideal for ambush tactics, while the decent penetration offered by the round was useful in an environment characterized by dense foliage and other natural obstructions.

In the early stages of the conflict, the US soldier was armed with the 7.62×51mm M14 rifle, which had a range and power well beyond those offered by the Type 50. But in jungle warfare rather than in open-ground warfare, the M14 was less convincing. It was heavy (3.88kg), long (1,117mm) and had only a 20-round box magazine. It was capable of full-auto fire at 750rds/min, but the muzzle-lifting recoil of the 7.62mm rifle round meant that controlling the weapon in this mode was

**Dien Bien Phu, 1954 (overleaf)**

At Dien Bien Phu, April 1954, three Viet Minh soldiers charge a French position. All three men are armed with the PPSh-41 fitted with 35-round box magazines. In the centre, the soldier delivers aimed fire; the rear sight of the PPSh-41 was graduated from 50m to 500m, but in reality 150–200m was the maximum effective range of the weapon. To his right, the soldier is in the process of reloading. The magazine latch behind the magazine port is open, and he is removing a fresh magazine from his three-magazine pouch, a common item of equipment amongst the Viet Minh. (Three grenades are also held in a pouch behind his back.) Communist forces in South-East Asia would utilize the PPSh-41 from the end of World War II well into the 1970s, counting on its reliability and easy serviceability. Only the inexorable spread of assault weapons such as the AK-47 sidelined the SMG.

Captured weapons of the North Vietnamese Army (NVA), during the Vietnam War. From bottom to top we have a PPS-43, a German MP 40 and a K-50M, the North Vietnamese conversion of the Chinese Type 50. (DoD)

problematic. Although the M14 also offered an effective range in excess of 600m, much of the conflict in Vietnam took place at ranges of less than 100m. At least the M14 was reliable; the same cannot be said of the US/South Vietnamese M16 rifles, which experienced serious problems with stoppages when first distributed in the theatre. (Many of these problems were admittedly due to issues with poor ammunition rather than the gun itself.) By contrast, the Type 50 and K-50M offered reliability, controllable full-auto fire, a practical range for the theatre conditions and portability in the jungle. It is little wonder that we even see photographs of US soldiers wielding World War II-designed Soviet weapons in Vietnam.

As the Cold War wrapped itself around the globe, Soviet weaponry achieved a massive distribution. The guns were plentiful and cheap, and they spread to corners of the world a long way from their place of origin. The scale of the distribution was aided by the licensed production, or the simple copying, of the designs in foreign nations. Between the 1950s and the 1980s, therefore, PPSh-41s and PPS-43s appeared in the most disparate locations. We see them clutched by revolutionaries in Cuba and on the streets of Hungary, by boy soldiers in various African states and by 'freedom fighters' in the Lebanon. The sheer durability of these guns also means that many of the weapons survived in use well beyond the end of the Cold War, and appeared in insurgent hands during the recent conflict in Iraq. US and Coalition forces made regular weapons seizures in Iraq, and it was far from uncommon for weapons from another era to be found amongst the stockpiles, as this US DoD report makes clear:

> Earlier yesterday, soldiers from 4th Battalion, 23rd Infantry Regiment, 172nd Stryker Brigade Combat Team, seized a weapons cache from the septic system of a resident's home in northern Baghdad around 11:55 a.m. The cache consisted of an AK-47 assault rifle, a 9 mm pistol, eight fully loaded AK-47 magazines and two Russian-made hand grenades.
>
> A day earlier, an Iraqi citizen's tip led soldiers from Troop B, 1st Squadron, 61st Cavalry Regiment, 4th Brigade Combat Team, 101st Airborne Division, to the discovery of a large weapons cache and the apprehension of six suspected terrorists in southeastern Baghdad around 6:40 p.m. Sept. 18.
>
> A concerned Iraqi citizen told the soldiers that terrorists attempted to kidnap civilians in front of his residence. The soldiers then saw a suspicious vehicle speeding away from the area. The vehicle was stopped at a nearby Iraqi police checkpoint and searched, revealing an AK-47 assault rifle.
>
> Soldiers then conducted a detailed search of the area and seized weapons caches consisting of 30 rocket-propelled-grenade rounds, four

Both the PPSh-41 and the PPS crop up regularly in illegal arms trading across the world. Here a customer buys a PPSh-41 at an arms bazaar in Yemen. (© Daniel Hunger/dpa/Corbis)

> RPG launchers, a 60 mm mortar tube, seven 82 mm mortar rounds, three flash-bang grenades, a fragmentation grenade, two PKM machine guns, two AK-47 assault rifles, a PPSH machine gun, two SKS assault rifles, a PPSH drum with ammo, two drums of 7.62 mm ammunition, 18 loaded AK-47 magazines, 2,000 rounds of 7.62 mm ammunition and various bomb-making material. (American Forces Press Service 2006)

Here the old and the new sit side by side, including the venerable PPSh-41. Yet the reference to the AK-47 here triggers a shift in our story. For with the advent of this weapon, the Soviet SMGs of World War II would be forever sidelined by an entirely new type of weapon.

Yugoslavia, 1992. Many old Soviet weapons helped fuel the internecine conflict in the Balkans in the 1990s, including this PPSh-41 with its traditional drum magazine. (© Jon Jones/Sygma/Corbis)

## THE ASSAULT RIFLE

During the 1930s and early 1940s, German studies into the nature of infantry warfare came to a judicious conclusion. Most small-arms exchanges took place at ranges of up to 400m, even though soldiers were either equipped with rifles that could kill at ranges of beyond a kilometre, or SMGs that were at their best at ranges of 100–200m. This fact led to German firearms designers experimenting with weapons designed around a new type of 'intermediate' 7.92×33mm *kurz* (short) cartridge, designed by Polte of Magdeburg specifically for optimal performance at ranges under about 600m. (Germany's full-power rifle cartridge at this time was the 7.92×57mm Mauser.) The goal was to produce a weapon that offered penetration and high-velocity reach, but combined these qualities with controllable selective fire.

The first weapons designed to fulfil this new criteria were the MKb 42(H) designed by Louis

The 7.92×33mm MP 44 was a new direction in firearms design, one that would eventually consign the PPSh-41 and PPS-43 to history. Assault rifles gave the same full-auto firepower, but with greater range and tactical versatility. (Armémuseum; The Swedish Army Museum)

A member of the Syrian Honour Guard stands to attention in the 1990s, with his AKM by his side. The AK rifles offered greater firepower than the SMGs, but they continued in the Soviet tradition of simplicity and respected reliability. (DoD)

Schmeisser and produced by Haenel (hence the 'H') and the MKb 42(W) produced by Walther. Both used gas-operated mechanisms and 30-round detachable box magazines, but the former was of a simpler and more convincing design, and it became the prototype of the world's first true 'assault rifle' – the MP 43/MP 44/StG 44 (the weapon underwent frequent revisions in its title).

The assault rifle concept was a major step forward in thinking about infantry firepower. The StG 44 could fire the 7.62mm rounds at 500rds/min with a muzzle velocity of 700m/sec – more than 200m/sec greater than that achieved by the Soviet SMGs. And whereas the 7.62mm Tokarev bullet weighed 5.57g (86gr), the German round weighed 8.1g (125gr). The consequence was that the StG 44's bullet carried much greater kinetic energy over longer distances, but the weapon remained controllable by the user. Accurate bursts of full-auto fire could be delivered to 300m (the Soviet SMGs could reach this distance, but by this point accuracy and penetration were definitely waning), and in semi-auto mode the shooter could take shots up to 600m. Only the limited distribution of the StG 44 prevented it from having a much greater impact on infantry combat

than it did, but the principle of the intermediate-round weapon was not lost on the world's gun designers.

It is not the place here to provide a full history of the development of the greatest assault rifle in history, the AK-47. (See instead Gordon Rottman's history of the AK-47 in the Osprey Weapon series.) Suffice to say that design of the new weapon, the brainchild of military engineer Mikhail Kalashnikov and his design team, began in the mid-1940s and in 1949 the AK-47, as it was known, was adopted as the standard rifle of the Soviet military.

The AK-47, and its modernized version, the AKM, went on to become history's most successful and prolific weapon system. To date an estimated 80 million of these firearms and their variants have been manufactured and distributed around the globe, fuelling wars, insurgencies and criminality on a massive scale. It is thought that 90 per cent of all people killed in wars since 1945 have been done to death by small arms, and the AK-47 must account for a major proportion of this total.

The most important consequence of the development of the AK-47 for the Soviet SMGs was that it to a large extent took away the rationale for SMGs in general. Like the StG 44, the 7.62×39mm Kalashnikov gave all the full-auto firepower advantages of the SMG, but with a more impressive range and destructive effect. The reliability of the new gun was also astonishing, even more so than the SMGs, and its unprecedented availability meant that many other guns were crowded out of the market.

The PPSh-41 and PPS-43 soldiered on in Soviet stocks into the 1950s, often with armoured vehicle crews and other specialist troops such as security forces and border guards, but the momentum towards the AK-47 was inexorable, and by the end of the decade the SMGs were largely in the hands of foreign armies. The PPSh-41 and PPS-43 also faced a fresh post-war challenge in the form of a new generation of ultra-compact SMGs, such as the Czech CZ 23 series and the Israeli Uzi. The latter was a simple 9mm blowback weapon that, with its stock folded, measured just 470mm – its length was reduced by locating the magazine in the pistol grip and using a telescoping bolt to wrap around the rear of the barrel. It could fire at 600rds/min.

The Uzi's rationale as an open battlefield weapon was thrown into doubt by its encounter with the Arab states' AKs in the 1967 Six-Day War (leading to the development of the Galil

A Viet Cong soldier stands with an AK-47 in 1973. By the end of the Vietnam War, weapons such as the PPSh-41 looked decidedly dated by the side of a new generation of assault rifles. (Defense Visual Information Center)

rifle for the Israel Defense Forces), but as a special-forces and police weapon it was (and remains) superb. The Micro-Uzi variant offered cut-down dimensions and weight but with increased firepower – 900rds/min. In 1966, Heckler & Koch's 9mm MP5 also entered service. This high-quality weapon was a very different animal from the PPSh-41/PPS. It fired from a closed bolt rather than an open bolt, and this design approach changed the characteristics and operational capabilities of the gun significantly. Closed-bolt guns have much-improved accuracy compared to open-bolt weapons, as when the trigger is pulled there is no significant shift of mass (i.e. only the firing pin moves) to affect the point of aim. This configuration makes closed-bolt SMGs highly accurate, and therefore ideal for use by special forces and elite law-enforcement units.

In this new world of firearms design, the PPSh-41 and PPS-43 looked decidedly dated very quickly. Hence the guns went into the peripheries of firearms usage, into the hands of insurgent forces whose need for sophistication was limited. What they needed most was a straightforward source of firepower, and the Soviet SMGs provided this in spades.

## NEW BUILD

Age is starting to tell on guns such as the PPSh-41 and PPS-43. Even though they were built to last and endure, any gun with a manufacture date of the 1940s or 1950s will by now be getting to the end of its serviceable existence. This is not to say that thousands of privately owned Soviet SMGs are not still being fired around the world. YouTube is replete with clips of modern-day firings of these weapons, the targets typically being household objects or water-filled containers to add a bit of drama to the proceedings. What is evident from the videos, however, is how much firepower these guns can still put down range. Even in an age of powerful assault rifles, the Soviet SMGs of World War II are still to be respected.

Famous firearms rarely die out altogether, but tend to re-emerge in legally acceptable forms suited to the firearms enthusiast who wants to own a piece of history, albeit a replica version. In the United States, both the PPSh-41 and PPS-43 are available in modern semi-auto forms and (in some states) full-auto historical weapons. The modern weapons are in most cases faithfully produced according to the original design, in the original 7.62×25mm calibre. However, some versions come with modern modifications. A look on the Internet at the time of writing revealed, for the sum of $499, a PPS-43 semi-auto 'pistol' firing from a closed bolt and with the folding stock permanently in its folded position, doubtless to make the weapon qualify for the pistol category with the Bureau of Alcohol, Tobacco and Firearms (ATF). Indeed, the Soviet SMGs have attracted some legal attention over the last two decades. For example, in 2004 the InterOrdnance of America firm was investigated by the ATF over its importation and sale of firearms 'kits'. The following is a press release from the Department of Justice:

According to the indictment, Ulrich and Oliver Wiegand are German nationals who established Interordnance of America in June 1995 as a firearms importation business and used the business to illegally import machineguns into the United States as machinegun component parts. According to the indictment, Ulrich and Oliver Wiegand also owned and controlled two foreign companies Wiegand Ordnance GmbH, located in Witten, Germany and Interordnance Waffenhandel GmbH, located in Ferlach, Austria, which were used by Ulrich and Oliver Wiegand to illegally import Russian-made PPSH 41 machinegun component parts into the United States for subsequent sale by Interordnance of America. In addition, the indictment alleges that Ulrich and Oliver Wiegand also illegally imported FN FAL IMBEL and STEYR MP69 machineguns. The indictment alleges that Ulrich and Oliver Wiegand imported the machinegun component parts knowing that the machineguns had not been destroyed according to ATF specifications. Further, the indictment alleges that Ulrich and Oliver Wiegand sold these machineguns as parts kits to customers throughout

The PPSh-41 proved itself in a broad range of theatres following the end of World War II. Here we see the guns in the hands of Angolan liberation fighters in 1968. (Cody Images)

> the United States knowing that the component parts could be assembled as functional machineguns. According to the indictment, Ulrich and Oliver Wiegand, through Interordnance of America, sold over 2000 PPSH 41, over 1000 FN FAL IMBEL and over 500 STEYR MP69 machineguns to customers throughout the United States without conducting any background checks and without recording any ownership registration information with the National Firearms Registration and Transfer Record. (Department of Justice 2004)

The simplicity of the PPSh-41 design would make it a relatively simple affair to assemble from the component parts. Forums relating to the case include some very disgruntled customers who bought what they believed was a perfectly legal kit, but subsequently received a visit from ATF inspectors. The implications of this case worked their way even up to the

Hungary, October 1956. This woman, fighting during the Hungarian Uprising of 1956, has equipped herself with a PPSh-41, either from Hungarian government stocks or captured from Soviet occupiers. (Cody Images)

Supreme Court, regarding the treatment of one Victor Rita, who himself bought one of the InterOrdnance kits:

> The basic crime in this case concerns two false statements which Victor Rita, the petitioner, made under oath to a federal grand jury. The jury was investigating a gun company called InterOrdnance. Prosecutors believed that buyers of an InterOrdnance kit, called a 'PPSH 41 machinegun "parts kit,"' could assemble a machinegun from the kit, that those kits consequently amounted to machineguns, and that InterOrdnance had not secured proper registrations for the importation of the guns. App. 7, 16–19, 21–22.
>
> Rita had bought a PPSH 41 machinegun parts kit. Rita, when contacted by the Bureau of Alcohol, Tobacco, and Firearms and Explosives (ATF), agreed to let a federal agent inspect the kit. Id., at 119–120; Supp. App. 5–8. But before meeting with the agent, Rita called InterOrdnance and then sent back the kit. He subsequently turned over to ATF a different kit that apparently did not amount to a machinegun. App. 23–24, 120; Supp. App. 2–5, 8–10, 13–14.
>
> The investigating prosecutor brought Rita before the grand jury, placed him under oath, and asked him about these matters. Rita denied that the Government agent had asked him for the PPSH kit, and also denied that he had spoken soon thereafter about the PPSH kit to someone at InterOrdnance. App. 19, 120–121; Supp. App. 11–12. The Government claimed these statements were false, charged Rita with perjury, making false statements, and obstructing justice, and, after a jury trial, obtained convictions on all counts. App. 7–13, 94, 103. (US Supreme Court, RITA v. UNITED STATES (No. 06-5754) 2007)

The Supreme Court case related more to the legal process of the investigation and subsequent conviction. Yet from the perspective of this study it is evident to see that the PPSh-41 design still survives in various forms, albeit sometimes masked in debates about what constitutes a 'machine gun'. The durability of old weapons, and the small-scale production of new ones, means that the PPSh-41 and the PPS will continue to burn through magazines for the foreseeable future.

# CONCLUSION

In many ways, the Soviet SMGs of World War II were unremarkable weapons. They were strictly functional pieces of equipment, designed to fire ammunition rapidly, repeatedly, without the need for sophisticated maintenance or, for the most part, advanced training. They were not the most powerful guns to grace the battlefields of World War II, nor the quickest firing, nor the most accurate. From the perspective of features and capabilities, they are unexceptional.

To take this attitude is, of course, to miss the point. The soldier on the battlefield has very different priorities for his personal firearm than a civilian, browsing at his leisure in a gun shop for a gun to take down to the controlled and clean conditions of the range. Chief of all, a soldier wants a gun that is reliable – there are surely few greater causes of anxiety than pulling a trigger on the battlefield and hearing nothing but a mechanical click. It was this criterion that the Soviet SMGs fulfilled brilliantly. Built with rugged simplicity in mind, the weapons offered the reassurance of a gun that would keep working through all the detritus and demands of the battlefield. Field maintenance requirements were fairly minimal, and as long as the gun was properly lubricated it would keep working no matter what the conditions.

Then there was the matter of firepower. The author has memories of watching, many years ago, an interview conducted with a Soviet veteran of the battle of Stalingrad. (The title and the details of the programme itself are unfortunately long forgotten, but the memory of what was said is sharp.) He recounted how, armed with a PPSh-41, he suddenly came upon a German soldier as he rounded the corner of a devastated building. With quick responses, he raised his gun and let off a long burst. With an expression wearied by years of replaying dark memories, the old soldier said that the image of what the SMG did to his opponent – essentially blasting him to pieces – lived with him for the rest of his life. Beyond any rather sterile debates about overpenetration, kinetic-energy transfer and

knock-down power, the fact remained that a burst of 7.62×25mm rounds at close range, and fired at 600–900rds/min, would have a quick and catastrophic effect on the victim.

As we indicated at the very beginning of this book, SMGs are one of the most lethal tools for killing or at least incapacitating an individual in short order. Recognizing this fact, and noting that the SMG's bullet distribution meant that precision accuracy wasn't necessary for the weapon to be brutally effective, the Soviet forces ensured that they were as widely distributed as possible through the ranks. On an imaginative level alone, the thought of facing an entire battalion or regiment of men all armed with 900rds/min SMGs, is disquieting to say the least. The wall of the lead coming from such a force must have had enormous powers of persuasion, even if not always intelligently applied on a tactical level. In the hands of a combat savvy veteran, a PPS or PPSh-41 must in turn have been the ultimate 'force multiplier', particularly in the context of street fighting, where brutal close-quarters firepower really mattered.

In this conclusion, we see a photograph of the huge bronze memorial statue that looms over the Seelow Heights in Germany, site of one of the great endgame battles of World War II. The soldier represented rests his hand confidently on the stock of his PPSh-41, slung horizontally across his chest. In this statue, the PPSh-41 seems to stand for more than just a tool of war. Like the soldier himself, it represents Soviet defiance, the gun being the physical manifestation of the soldier's simple will to fight and win. Only a gun that works superbly can achieve such a harmony with the individual who uses it.

A bronze statue of a Soviet soldier seen on the grounds of Seelow Heights Memorial in Seelow, Germany, the PPSh-41 forming a visual centrepiece of the statue. (© Patrick Pleul/dpa/Corbis)

## GLOSSARY

| | |
|---|---|
| **ACP** | Automatic Colt Pistol (cartridge) |
| **BLOWBACK** | A system of firearms operation that uses the breech pressure generated upon firing to operate the bolt |
| **BOLT** | The part of a firearm that closes the breech of the firearm and often performs the functions of loading, extraction and (via a firing pin) ignition |
| **BREECH** | The rear end of a gun barrel |
| **BREECH BLOCK** | A mechanism designed to close the breech for firing; roughly analogous to 'bolt' (qv) |
| **CARBINE** | A shortened rifle |
| **CHAMBER** | The section at the rear of the barrel into which the cartridge is seated for firing |
| **CLOSED BOLT** | Refers to firearms in which the bolt/breech-block is closed up to the chamber before the trigger is pulled |
| **COOK-OFF** | The involuntary discharge of a cartridge by the build-up of heat in the chamber from firing |
| **EJECTOR** | The mechanism that throws an empty cartridge case clear of a gun following extraction from the chamber |
| **EXTRACTOR** | The mechanism that removes an empty cartridge case from the chamber after firing |
| **GAS OPERATION** | A system of operating the cycle of a firearm using gas tapped off from burning propellant |
| **LOCK TIME** | The time interval between pulling the trigger and the gun firing |
| **OPEN BOLT** | Refers to firearms in which the bolt/breech-block is held back from the breech before the trigger is pulled |
| **RECEIVER** | The main outer body of a gun, which holds the firearm's action |
| **SEMI-AUTOMATIC** | A weapon that fires one round and reloads ready for firing with every pull of the trigger |
| **SUPPRESSOR** | Device to reduce the audible sound of firing |

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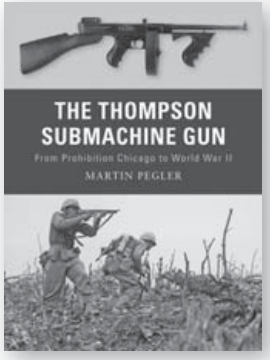


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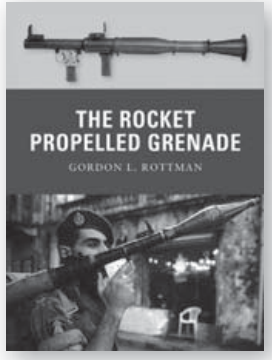


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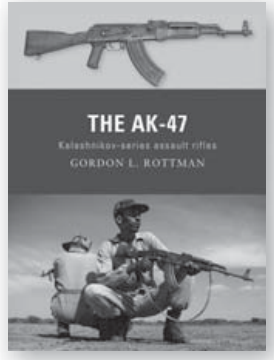


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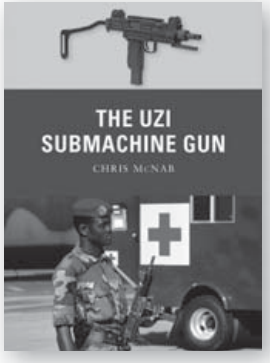


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**Editor's note**

In this book, metric units of measurement are employed as the Soviets used metric during World War II. For ease of comparison please refer to the following conversion table:

1km = 0.62 miles
1m = 1.09yd / 3.28ft
1cm = 0.39in
1mm = 0.04in
1kg = 2.20lb / 35.27oz

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